THE SCOTTISH COUNCIL FOR RESEARCH IN EDU[illegible]

SOCIAL IMPLICATIONS OF THE 1947 SCOTTISH MENTAL SURVEY

UNIVERSITY OF LONDON PRESS LTD.
WARWICK SQUARE, LONDON, E.C. 4.

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PUBLICATIONS OF THE SCOTTISH COUNCIL FOR RESEARCH IN EDUCATION

XXXV

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2 copies

UNIVERSITY OF LONDON PRESS LTD
WARWICK SQUARE, LONDON, EC4
1953

Printed in Great Britain by
Robert Cunningham and Sons Ltd, Alva

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PREFACE

The Trend of Scottish Intelligence, which appeared in 1949, gave an account of the 1947 survey of the intelligence of eleven-year-old Scottish children, and compared the data with those of the previous survey fifteen years earlier. A strong negative association was found between size of family and the *average* score of children belonging to each size, in spite of many individual exceptions. There was not found, however, any fall in average score of the whole year-group, compared with that of 1932, as had been feared might be the case.

The present volume, the work almost exclusively of Mr James Maxwell, does not profess to advance any solution of this problem, but is a careful analysis of the inter-relationships of the social background of the children with their intelligence and their physique; not, it is true, for all the 75,211 children, but for a random sample of 7,380, namely, those born on the first three days of each month of 1936, for whom much extra information was collected. For the sake of completeness, another group, the twins, is also included in chapter VII.

The final chapter summarises most of Mr Maxwell's findings. 'It can be said', he concludes, 'that all the data point in the same direction', namely, that the occupational class of the father is the common factor in the differences found in intelligence and physique of the children; there is no suggestion that it is the cause.

From professional classes and large employers, through salaried employees, small employers, non-manual wage earners, skilled, semi-skilled, and unskilled manual workers there is a steady decrease in intelligence-test-score, height, weight, frequency of migration from district to district, and in the age of the mother; and a steady increase in family size and in overcrowding.

But *within* each occupational class the tendency persists for

children of larger families to score less in an intelligence test, to be shorter, and lighter; and the same is true *within* each degree of overcrowding, and for all ages of the mother. (The families of farmers and of agricultural labourers depart in some respects from these generalisations.)

The degree of overcrowding in the homes of these 7,380 children (a random sample of those born in 1936) is appalling. 'Almost exactly half live in homes containing two or more persons per room'; and among manual workers nearly a quarter in homes with three or more persons per room.

The Mental Survey Committee, and not least Mr Maxwell, wish to thank Miss Sheena Reside, Dr T Renshaw, Dr Z Swanson and Dr J Sutherland, who helped in various ways, especially by checking calculations, and Mrs Harrison, the operator of the Hollerith machine. Especially would they like to express their appreciation of the care exercised by Miss A Kennedy in assembling the data and the skill exhibited by her in preparing the typescript for the press.

The substance of chapter VII on Twins has previously appeared in *Population Studies*, in two articles by Mr Maxwell in collaboration with Mr S N Mehrotra (December 1949) and with Mr G Barclay (December 1950). Our thanks are due to the editor for permission to reproduce these two papers here.

The Committee intend to follow the present volume with a third, dealing mainly with the educational implications of the survey.

GODFREY THOMSON
Chairman

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INTRODUCTION

When the Scottish Council for Research in Education, at the instigation of the Population Investigation Committee and the Eugenics Society, undertook the 1947 Scottish Mental Survey, it was agreed to extend the scope of this survey compared with that of the 1932 Mental Survey by collecting certain sociological data regarding the pupils tested. In the 1932 Survey a group-intelligence test was given to all eleven-year-old children in Scotland. One thousand of these children were also tested individually by a Binet test.[1] A few years later a further sample of eleven-year-old children, 874 in number, selected by date of birth, were individually tested as the thousand children of the 1932 survey tested individually appeared to be a biased sample.[2]

In 1947 all eleven-year-old Scottish children were given the same group test as was used in 1932. In addition, a Sociological Schedule of seventeen items was prepared for each child; 75,451 of these schedules were completed.[3]

For 7,380 of these children a more comprehensive schedule, known as the Random-Sample Sociological Schedule, was completed. This schedule contained twenty-five items, seventeen of which were the same as those of the general sociological schedule. The remaining items concerned the pupil's height and weight, the father's occupation, the mother's age, the occupancy rate of the home, and the incidence of certain types of physical defect.[4] To obtain this information the home of

[1] *The Intelligence of Scottish Children.* Publications of the Scottish Council for Research in Education, V. London: University of London Press Ltd, 1939

[2] *The Intelligence of a Representative Group of Scottish Children* by A M Macmeeken. Publications of the Scottish Council for Research in Education, XV. London: University of London Press Ltd, 1939

[3] *The Trend of Scottish Intelligence.* Publications of the Scottish Council for Research in Education, XXX. London: University of London Press Ltd, 1949. Appendix I to Chapter III, pp 36-7

[4] *Loc cit* Appendix II to Chapter III, pp 38-9

each of these 7,380 pupils was visited usually by a district nurse or health visitor.[1]

This group of 7,380 children is called the Thirty-Six-Day Sample. They were the children born on the first three days of each month in 1936. The extent to which they are a valid representation of all the survey children is discussed in chapter I of this volume. They have proved to be a good sample, and date of birth can be recommended as a satisfactory basis of selection. The choice of the first three days of the month, however, leads to a discrepancy in age of about fourteen days between the thirty-six-day sample and the parent population of eleven-year-old children. Selecting children born on the middle three days of the month would have obviated this.

A further sample, consisting of children born on the first days of February, April, June, August, October and December, was drawn. This group of 1,208 children,[2] known as the Six-Day-Sample, were given an individual Binet test (Terman-Merrill Revision, Form L), so that for each of them is recorded not only a group test score, the fuller sociological information of the Random Sample schedules, but also an IQ. The six-day sample has also proved to be truly representative; it is this group whose future progress is being followed up.

Most of the data discussed in this volume relate to the thirty-six-day sample, as it is only for these children that the fuller sociological record is available. All the data are not available for all the children; thus in most of the tables in the text the total numbers given are less than 7,380 for the thirty-six-day sample, and less than 75,211 (the final number of acceptable schedules) for the whole survey group. It was not considered always necessary to encumber the tables of data by 'book-keeping' entries of the numbers for whom the data were not recorded.

[1] *The Trend of Scottish Intelligence*, p 32

[2] In *The Trend of Scottish Intelligence*, Chapter IV, Appendix III, there is printed a complete list of the Terman-Merrill IQs and Verbal Test Scores of the six-day-sample. 1,214 such entries appear in this list, though in the text of Chapter IV, the number tested individually is given as 1,215. The correct number is 1,215, and it is with this number that the computations have been performed. In the list of scores one of two girls who had identical IQs (96) and identical verbal test scores (32) has been inadvertently omitted. For various reasons seven of these 1,215 children have been omitted from the group whose progress is being followed up.

I

THE THIRTY-SIX-DAY SAMPLE AS REPRESENTATIVE OF THE WHOLE 1947 SURVEY POPULATION

WHEN the 1947 Scottish Mental Survey was being planned, the Committee had in mind not only a further contribution to the information available about the relation between family size and intelligence, but also an investigation into the relationships existing between intelligence test score, the physical condition of the children and the socio-economic status of the child's home. It was considered impracticable, within the limits set by the facilities available for the survey, to obtain information on these topics for every one of the eleven-year-old Scottish children who participated in the survey. Data on the occupation of the child's father, the age of his mother, the number of persons per room in his home, the child's height, weight, and physical integrity are available for the children in the thirty-six-day sample only.

Before we can properly estimate how far any conclusions reached from the thirty-six-day-sample data are valid for the whole population of Scottish eleven-year-olds, we must ascertain whether the thirty-six-day sample is representative of the whole survey population in respect of the data common to both groups. Should we find that the thirty-six-day-sample children are for such data a fair representation of the whole survey population, it is not unreasonable to proceed on the assumption that in the other respects also the sample is a fair representation of the whole population. At the present stage of the comparison the data for age, sex, test score, size of family and education authority are available for both the thirty-six-day sample and the whole survey group. Let us consider these variables in turn.

AGE

The children constituting the thirty-six-day sample were those born on one of the first three days of each month in 1936. In order to ascertain any difference between the ages of the thirty-six-day sample and the ages of the whole survey group, we have on this occasion calculated to the nearest day the ages of the children on the date of the group test, 4th June 1947. This is unnecessarily precise for most purposes, and subsequent calculations involving age will be in terms of months.

The mean age of the whole 1947 survey group ($n=75{,}211$) on the 4th June was 10 years 342·3 days. *A priori* we should expect the mean age of the thirty-six-day sample to be fourteen days more, or if we make allowance for the different number of days in the months of the year, 13·9 days more. The mean age of the sample ($n=7{,}380$) is actually 10 years 355·3 days, a difference of thirteen days between the age of the sample and that of the whole group. The thirty-six-day sample, therefore, is about one day younger than expectation. This difference of one day is negligible, especially in view of the fact that we have assumed that in any given month the number of children born on each day of that month is the same. If we confine the comparison to the 70,805 children who were present to take the group test on 4th June, and the 6,857 in the sample drawn from the 70,805, we find the same result, the mean age of the larger group being 10 years 342·5 days and that of the sample being 10 years 355·5 days. We reach the conclusion that, allowing for the selection of the sample by dates of birth, there is no significant difference between the thirty-six-day sample and the survey population from which it was drawn, either in average age or in any difference of age between those children present on the day of the group test and the absentees on that occasion.

SEX

Of the 75,211 children in the whole survey group, 37,998, or 50·52 per cent, were boys; in the thirty-six-day sample of 7,380 children, 3,674, or 49·78 per cent, were boys. Of the 70,805 children who sat the group test, 35,809, or 50·57 per cent, were

boys; and in the thirty-six-day sample, similarly, 3,420, or 49·88 per cent, were boys. In neither case is the difference between the proportion of the sexes in the sample and in the whole 1947 population statistically significant ($P >$ ·20).

TEST SCORE

The distributions of test scores by month of birth for the whole survey group and for the thirty-six-day sample are given in appendix tables 1 and 2.[1]

The mean test score of the 70,805 children born in 1936 is 36·688, with a standard deviation of 16·05. The mean test score of the thirty-six-day-sample children is 36·660, with a standard deviation of 16·13. The difference between the means, therefore, without correction for age, is 0·028 ± ·204 points of score, which is not significant. But we have seen that the mean ages of the two groups are not the same; it is accordingly necessary to make a correction for difference in age. The regression of test score on age for the whole survey group is 0·67, and for the thirty-six-day sample 0·68 points of test score per month, the difference not being significant. If the children are divided into two groups, the thirty-six-day sample and the remainder, that is, those children born on days other than the first three days of the month, and the correction for difference in age is applied, it is then found that the difference in mean test score is 0·346 ± ·202 points in favour of the remainder. This difference is not statistically significant at the five per cent level (t = 1·71).[2]

It would appear, therefore, that the thirty-six-day sample is slightly, but not significantly, inferior in test score. We shall, therefore, neglect this slight difference in average test scores and consider the thirty-six-day-sample test scores as being a true representation of those of the whole survey group, and use them without correction for age differences.

The sex differences in test scores are given in table I.

[1] As the full tables are too large to be included in the text, they have been relegated to an appendix at the end of the volume. Appendix tables are numbered in Arabic to distinguish them from text tables, which are numbered in Roman.

[2] The calculations involving the correction for differences in mean age were performed by Dr D N Lawley.

TABLE I

SEX DIFFERENCES IN TEST SCORE

	Mean Test Score	Variance (σ^2)	$\frac{\sigma^2}{n}$	n
All 1947 Boys -	35·809	277·343	·0077	35809
All 1947 Girls -	37·587	235·610	·0067	34996
Difference	1·778		Total	70805
Thirty-six-day Boys	35·958	274·506	·0803	3420
Thirty-six-day Girls	37·359	245·063	·0713	3437
Difference	1·401		Total	6857

The sex difference in average test score is therefore 0·377 points greater in the whole 1947 group than it is for the thirty-six-day sample. This difference is not statistically significant.

GEOGRAPHICAL DISTRIBUTION

For each pupil in the survey was recorded the education area in which the school attended was situated. Pupils who were attending an independent school which was situated within the geographical boundaries of an education authority have been included in the numbers for that area. The classification of both the thirty-six-day-sample pupils and the whole survey group by education area is given in table II.

The thirty-six-day sample, therefore, contains 9·78 per cent of the whole group. Examination of table II gives the impression that the children in the thirty-six-day sample are fairly uniformily distributed throughout the country, no signs of undue bias being evident. The χ^2 (*chi* squared) test in the form appropriate to the present situation (namely, of a sample contained in a larger sample) gives a value higher than expectation, but not significantly so ($P=0{\cdot}12$). There is therefore no significant difference between the thirty-six-day sample and the whole survey group in respect of their distribution among education authorities.

SIZE OF FAMILY

As a considerable number of the topics discussed in this volume involve the size of family to which the pupil belongs,

TABLE II

CLASSIFICATION OF PUPILS ACCORDING TO EDUCATION AREA IN WHICH THEIR SCHOOL IS SITUATED

	(1) *All* 1947 *Pupils*	(2) *Thirty-six-day Sample*	(3) (2) *as Percentage of* (1)
Cities:			
Aberdeen	2780	241	8·7
Dundee	2661	275	10·3
Edinburgh	6449	663	10·3
Glasgow	17317	1708	9·9
Total	29207	2887	9·88
Counties:			
Aberdeen	2353	230	9·8
Angus	1293	135	10·4
Argyll	829	74	8·9
Ayr	4881	486	10·0
Banff	924	90	9·7
Berwick	268	16	6·0
Bute	213	19	8·9
Caithness	323	33	10·2
Clackmannan	544	48	8·8
Dumfries	1244	133	10·7
Dunbarton	2180	209	9·6
East Lothian	702	80	11·4
Fife	4298	401	9·3
Inverness	1179	110	9·3
Kincardine	422	38	9·0
Kirkcudbright	460	48	10·4
Lanark	8453	827	9·8
Midlothian	1378	163	11·8
Moray and Nairn	800	86	10·8
Orkney	274	31	11·3
Peebles	160	18	11·3
Perth and Kinross	1739	155	8·9
Renfrew	4900	441	9·0
Ross and Cromarty	783	78	10·0
Roxburgh	602	54	9·0
Selkirk	227	20	8·8
Stirling	2578	255	9·9
Sutherland	162	22	13·6
West Lothian	1367	114	8·3
Wigtown	464	59	12·7
Zetland	248	20	8·1
Total	46248	4493	9·72
Whole Country	75455	7380	9·78

we must also ascertain to what extent the thirty-six-day-sample children are typical of the population in that respect. Table III presents the distribution of size of family for the thirty-six-day-sample children and all the 1947 survey children.

TABLE III

DISTRIBUTION OF THIRTY-SIX-DAY SAMPLE AND ALL 1947 SURVEY GROUP BY SIZE OF FAMILY

Size of Family	*All* 1947	*Thirty-six-day Sample*	*All* 1947 *Reduced Proportionately*
1	7851	756	761·62
2	15952	1529	1547·49
3	14588	1437	1415·17
4	10942	1095	1061·47
5	7672	723	744·25
6	5055	469	490·38
7	3342	319	324·20
8	2106	216	204·30
9	1281	117	124·27
10	702	75	68·10
11	353	40	34·24
12 and over	356	34	34·54
	70200	6810	6810·03

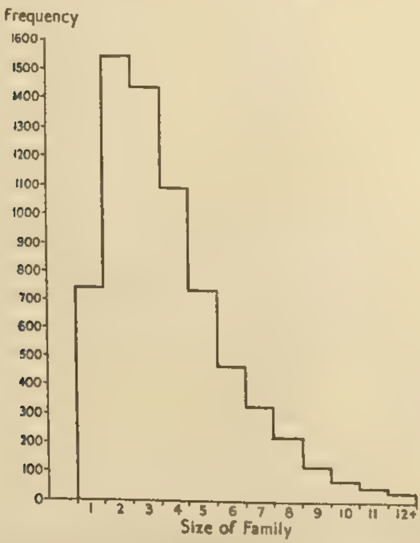

FIGURE 1 Distribution of Family Size for Thirty-six-day Sample

It is clear that the general outlines of both distributions are very similar. Applying the χ^2 test as for table II, we obtain confirmation of our impression of close correspondence ($P=0{\cdot}82$). Figure 1 represents the distribution of size of family

TABLE IV

MEAN TEST SCORE FOR EACH SIZE OF FAMILY

Size of Family	(1) *All* 1947 *Children*	(2) *Thirty-six-day Sample*	(3) *Difference* (1) − (2)
1	42·03	41·83	+0·20
2	41·74	41·73	+0·01
3	38·32	38·94	−0·62
4	35·32	35·51	−0·19
5	32·51	32·44	+0·07
6	30·88	29·28	+1·60
7	29·45	29·63	−0·18
8	28·81	26·63	+2·18
9	27·97	27·30	+0·67
10	26·94	29·13	−2·19
11	27·34	27·63	−0·29
12 and over	24·26	24·06	+0·20

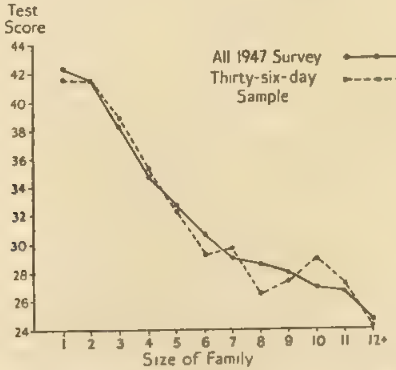

FIGURE 2 Mean Test Score per Size of Family. All 1947 Survey Children ($n=70{,}200$) and Thirty-six-day Sample ($n=6{,}810$)
The numbers of children are those given in table III

for the thirty-six-day sample. The distribution for the whole 1947 survey group coincides so closely that it is not practicable to represent both distributions separately on a graph of this scale.

We must also consider whether the relationship found between average test score and size of family in the whole eleven-year-old group also obtains for the thirty-six-day sample.[1] The data are presented in tabular form in table IV and graphically in figure 2.

It will again be noted that the mean test scores for each size of family are not greatly different for the two groups of children. The most marked variations occur in the larger families, where the numbers of children are small, and inspection of figure 2 leads to the conclusion that these divergencies are probably due to minor sampling fluctuations from the smoother curve of the whole 1947 survey population. By the usual statistical standards, none of these divergencies are significant at the five per cent level, except that for families of eight, where the difference is on the border-line of significance ($t = 1{\cdot}97$).

CONCLUSION

The method of selecting a random sample of an age group by date of birth was originally due to the late Dr Shepherd Dawson, and the selection of the thirty-six-day sample has proved to be a very satisfactory one. In each of the comparisons of the thirty-six-day sample with the whole eleven-year-old age group which has been made, no difference between the sample and the population from which it was drawn has been statistically significant. We have good grounds for proceeding to a fuller analysis of the thirty-six-day-sample data with confidence that this sample is a fair and unbiased representation of our larger population of eleven-year-old Scottish children, and we feel we can recommend this method of sampling for other investigations.

[1] *The Trend of Scottish Intelligence.* Publications of the Scottish Council for Research in Education, XXX. London: University of London Press, Ltd, 1949. Ch VII

II

HEIGHT AND WEIGHT: THE DATA

In planning a survey so extensive as the present one, it was felt that the physical condition of the children was an aspect which could not be safely ignored. The great majority of Scottish pupils are physically examined by the school medical services on three occasions during their school careers, usually shortly after their fifth, ninth and thirteenth birthdays. The information from this source about eleven-year-old children is therefore rather scanty. Nor is the relationship between the child's physical condition and his educational, intellectual and socio-economic status normally recorded, except in a few occasional special investigations.

The ideal arrangement would have been a routine school medical examination of all the eleven-year-old children taking part in the survey, but this was impracticable. With the co-operation of the school medical officers, nurses and health visitors, it nevertheless proved possible to obtain for the thirty-six-day sample a record of the height and weight of the children, together with a report of their condition in respect of certain specified diseases and defects. The height was measured with the usual measuring rod and recorded to the nearest completed half-inch; the weight was taken with the child stripped to the waist, without shoes, and was recorded to the nearest completed half-pound.[1]

Unfortunately, it proved impossible to implement the original plan of the Survey Committee to have each child weighed and measured within a short time from the date of the group test; and when all the schedules were finally returned, it was found that the children had been weighed and measured over a period of thirteen months, from May 1947 to May 1948 inclusive. By

[1] *The Trend of Scottish Intelligence*, ch III

combining the months of birth with the months of measurement (appendix tables 8 and 17) we can obtain the distributions for height and weight by age at the date of measurement (appendix tables 9 and 18). We are then able to calculate the average rate of increase of height and weight with age. As selection of the children by date of measurement might have occurred, such that, for example, the less robust children were absent from school when the measurements were taken in the first instance, the data for all children were compared with the corresponding data for children who were measured in June. The results for June children, who comprise about two-thirds of the total group, were not significantly altered by the addition of children measured in other months. Making the necessary adjustments for differences in age, as detailed in the appendix to this chapter (pp 25-28), we are able to estimate the height and weight of the children as they would have been, had the measurements been made at the date of the group test, 4th June 1947.

HEIGHT

In table V are given the heights, as at 4th June 1947, for the boys and girls whose age and date of measurement are both known.

TABLE V

HEIGHT IN INCHES AT DATE OF TEST

	Boys	*Girls*
Mean Height - - - - -	$54 \cdot 00 \pm 0 \cdot 05$	$53 \cdot 78 \pm 0 \cdot 05$
Standard Deviation of Height -	2·80	2·94
Rate of Increase in Inches per Month	0·15 –	0·15 +
Number of Pupils - - - -	3428	3543

Boys, therefore, are on the average about 0·2 inches taller than girls. This difference, though statistically significant, is small, and would indicate that there is no very marked difference in height between eleven-year-old boys and girls. A similar small difference in standard deviation indicates a somewhat greater spread of height among girls.

It is probable, however, that these results for height are to a considerable extent specific to the particular age of the children. From the records of the physical examinations carried out by the school medical services, boys are about half an inch taller

than girls when measured during their fifth and ninth years of age, but the position is reversed in the measurements taken during their thirteenth year, when the average height of girls is about half an inch greater than that of boys. By the sixteenth year the position of the two sexes is again reversed, the average height of boys being quite distinctly greater than that of girls.[1] Between the ages of eleven and thirteen plus, therefore, the relative positions of boys and girls in respect of height are being reversed. One possible explanation of our data is given by Cluver and Jokl[2] in a scheme of the differential rates of development of the sexes for both height and weight. At the age of eleven the rate of growth of girls begins to exceed that of boys, the tallest girls becoming for a period of about two years taller than the tallest boys; about the age of thirteen years, however, the tallest boys again come to exceed the tallest girls in height. At age eleven, the shortest girls are shorter than the shortest boys, and do not begin to outstrip the boys till the age of about thirteen; two years later, however, the shortest boys again become taller than the shortest girls. By the age of fifteen boys are accordingly at all levels taller than girls.

At the age of eleven girls are just beginning to grow more rapidly than boys. The average height of all boys in our sample is slightly greater than that of girls; but the relatively increasing height of the taller girls would tend to increase the range of height among girls, which would be shown in the greater variance of girls' heights. Corroboration is provided by the fact that the observed rate of increase of height with age is 0·161 inches per month for girls as against 0·142 inches per month for boys (see appendix I, pp 25-28). But these values may be the result of chance and cannot be taken as a definite indication of differential rates of growth. Though our results do not prove a differential rate of growth for boys and girls between the ages of eleven and fifteen, they are certainly consistent with such a situation. If we accept such a relationship between age and rate of growth for the two sexes, it means that our compari-

[1] The Committee are indebted to Dr J A G Keddie of the Department of Health for Scotland for assistance in obtaining these figures, and for valuable guidance in other matters concerning the physical condition of the children.

[2] *South African Journal of Medical Science*, No 10, 1945, pp 105-7

sons of boys and girls are specific to the particular age of the survey children. A similar relationship prevails in respect of weight.

The distribution of height for each sex is given in figures 3 and 4.

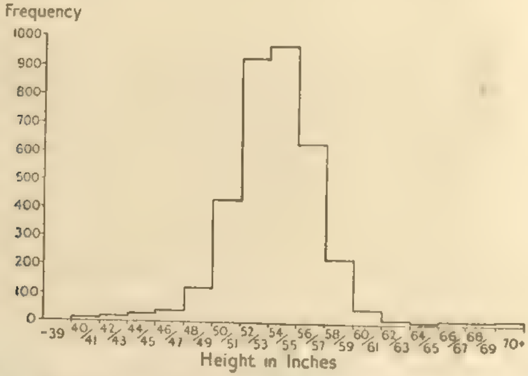

FIGURE 3 Distribution of Height of 3,428 Boys Born in 1936 and Measured May 1947 to May 1948 (not corrected for age)

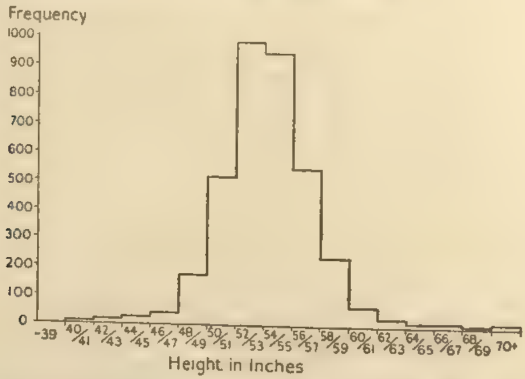

FIGURE 4 Distribution of Height for 3,543 Girls Born in 1936 and Measured May 1947 to May 1948 (not corrected for age)

The character of the distribution of height cannot be properly determined from these graphs, as the range of age over which the measurements were taken will have a distorting effect. If we consider only those pupils who were measured in June 1947 we obtain a much more homogeneous group, in which the effects of differences of age are at a minimum. From these pupils we obtain the distributions given in table VI.

TABLE VI

DISTRIBUTION OF HEIGHT OF 2,553 BOYS AND 2,669 GIRLS BORN IN 1936 AND MEASURED IN JUNE 1947

Height in Inches	*Boys*	*Girls*	*All*	*'Normal' Distribution with Same Mean and Standard Deviation*
70+	4	3	7	—
68–9	1	—	1	—
66–7	—	2	2	—
64–5	1	3	4	2
62–3	5	13	18	16
60–1	29	44	73	96
58–9	159	146	305	380
56–7	456	381	837	888
54–5	737	737	1474	1375
52–3	703	753	1456	1303
50–1	339	420	759	786
48–9	83	134	217	295
46–7	22	20	42	70
44–5	8	8	16	10
42–3	5	3	8	1
40–1	1	2	3	—
Total	2553	2669	5222	5222

	Boys	*Girls*	*All*
m_2	1·981	2·134	2·0634
m_3	+0·438	+1·050	+0·7297
m_4	22·083	22·911	22·4851
β_1[1]	0·025	0·113	0·061
β_2	5·63	5·03	5·28

Moments are given in units of two inches

[1]
$$\beta_1 = \frac{(m_3)^2}{(m_2)^3} \qquad \beta_2 = \frac{m_4}{(m_2)^2}$$

β_1 is required for the measure of skewness of a curve. If m_3 is negative, the curve is negatively skewed, and correspondingly if m_3 is positive the skewness is positive. $\sqrt{\beta_1}$ is obtained by dividing m_3 by σ^3.

β_2 is a measure of kurtosis, or the degree of flattening of a curve. For most distributions of the type that occur in this survey, it may be taken that if the value of β_2 is greater than 3, the curve is leptokurtic or peaked, and if the value of β_2 is less than 3, the curve is platykurtic or flattened.

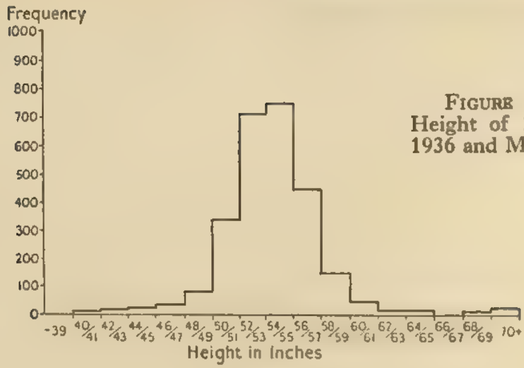

FIGURE 5 Distribution of Height of 2,553 Boys Born in 1936 and Measured in June 1947

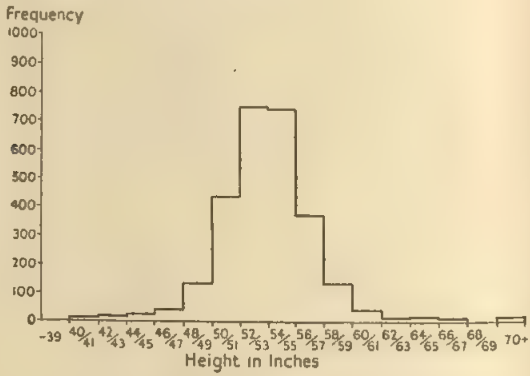

FIGURE 6 Distribution of Height of 2,669 Girls Born in 1936 and Measured in June 1947

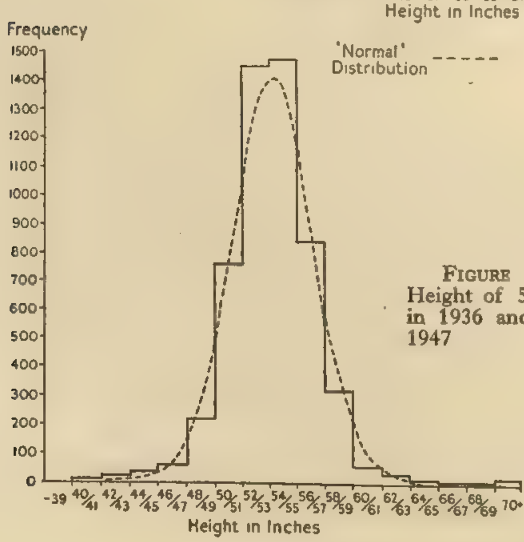

FIGURE 7 Distribution of Height of 5,222 Children Born in 1936 and Measured in June 1947

The distributions of boys and of girls show very similar characteristics. Both are positively skew to a very slight degree, and both are distinctly leptokurtic, there being a marked clustering of heights near the mean. A feature of both distributions is the small cluster of extremely tall children, and the absence of a corresponding group of short children. As all these tall pupils are over five feet ten inches, we have given fuller particulars in appendix II (p 29). Figure 7 shows that the distribution of height is not exactly normal, the leptokurtosis being quite distinct; the deviation from normality, though not extreme, is statistically significant, the χ^2 test giving a value of P less than 0·01.

WEIGHT

The heights of the pupils in the thirty-six-day sample were, as we have seen, measured at various dates over a period of thirteen months. The same applies to the measurement of weight, which was usually recorded on the same occasion as the height. From appendix tables 17 and 18 (pp 277-93) we can obtain the relationship between age and weight. Again taking the children measured in June 1947 as a standard we find that the addition of the other children does not significantly alter this relationship. Making the necessary adjustments for differences in date of measurement (see pp 25-28), we obtain table VII, which gives the estimated weights in pounds at the date of the group test in June 1947.

TABLE VII

WEIGHT IN POUNDS AT DATE OF TEST

	Boys	*Girls*
Mean Weight - - - - -	69·72±0·17	68·35±0·19
Standard Deviation of Weight -	9·81	11·14
Rate of Increase in Pounds per Month	0·55	0·55
Number of Pupils - - - -	3426	3518

Weight shows almost the same features as height. Boys are heavier than girls by an average of about 1·4 pounds, this difference being statistically significant and representing a slightly greater relative difference between the sexes than for height. The standard deviation of weight is greater for girls than for boys, as it was for height. Reference to recent records of weights of school children of about nine years of age shows

the average boy of that age to be about two pounds heavier than the average girl of the same age. By the age of thirteen, girls are on the average between two and three pounds heavier than boys. By the age of sixteen boys appear to be about five pounds heavier than girls. The same differential rates of development between the ages of about ten to fifteen appear to apply to both weight and height, and our results are again consistent with such a situation. No distinct difference between the regression of weight for boys and girls appears in our results, and the difference in regression found for height is also within the limits of sampling error. Our figures for weight, like those for height, must be regarded as specific to the age of the survey pupils, and not as applying to children in general.

The distributions of weight are given in figures 8 and 9. Table VIII and figures 10, 11 and 12 present the distributions for the pupils measured in June 1947.

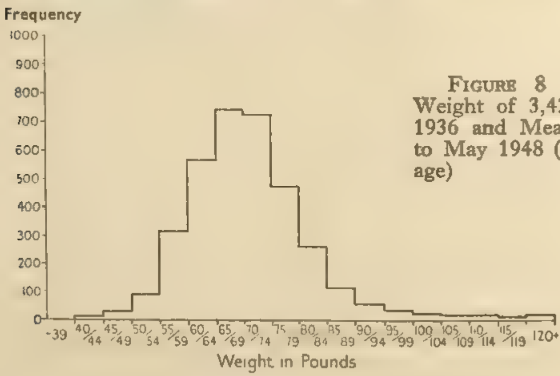

FIGURE 8 Distribution of Weight of 3,426 Boys Born in 1936 and Measured May 1947 to May 1948 (not corrected for age)

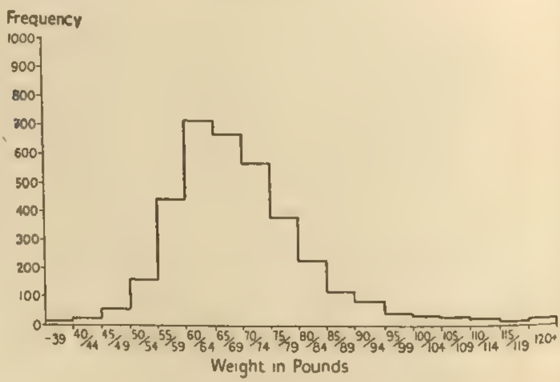

FIGURE 9 Distribution of Weight of 3,518 Girls Born in 1936 and Measured May 1947 to May 1948 (not corrected for age)

TABLE VIII

WEIGHT OF CHILDREN BORN IN 1936 AND MEASURED IN JUNE 1947

Weight in Pounds	*Boys*	*Girls*	*All*	*'Normal' Distribution with Same Mean and Standard Deviation*
120+	2	7	9	—
115–9	1	6	7	—
110–4	5	7	12	—
105–9	4	11	15	2
100–4	6	11	17	7
95–9	19	23	42	28
90–4	33	55	88	87
85–9	78	68	146	225
80–4	188	154	342	453
75–9	329	279	608	729
70–4	549	417	966	947
65–9	571	511	1082	979
60–4	437	571	1008	794
55–9	249	361	610	527
50–4	69	137	206	274
45–9	15	32	47	113
40–4	2	8	10	38
35–9	—	1	1	10
30–4	—	—	—	2
25–9	—	—	—	1
Total	2557	2659	5216	5216
m_2	3·634	5·011	4·356	
m_3	+5·032	+12·493	+8·547	
m_4	63·921	141·450	101·863	
β_1	0·53	1·24	0·88	
β_2	4·84	5·63	5·37	

Moments are given in units of five pounds

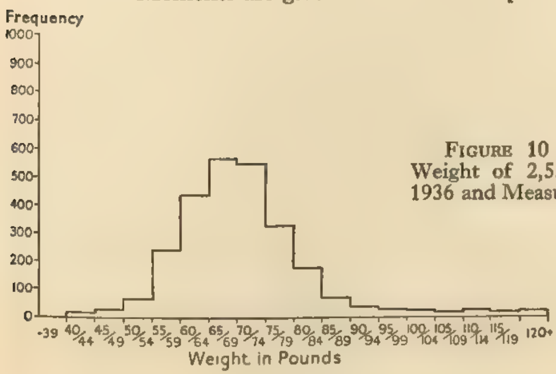

FIGURE 10 Distribution of Weight of 2,557 Boys Born in 1936 and Measured in June 1947

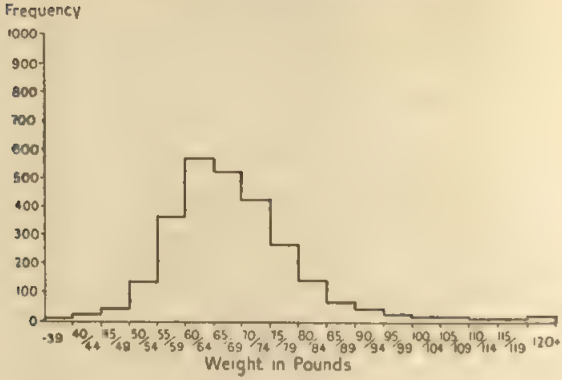

FIGURE 11 Distribution of Weight of 2,659 Girls Born in 1936 and Measured in June 1947

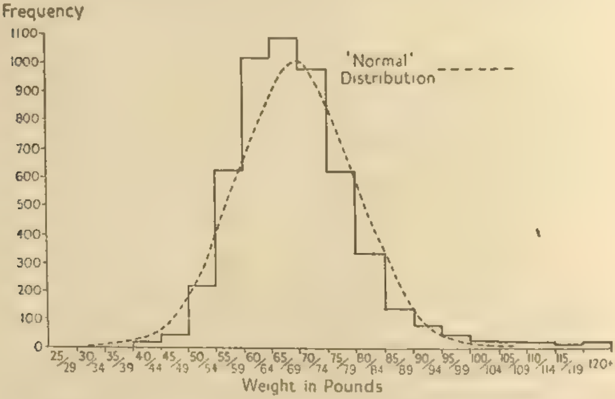

FIGURE 12 Distribution of Weight of 5,216 Children Born in 1936 and Measured in June 1947

The distributions of boys and girls are similar in general outline. Both are positively skew, girls more so than boys. As in the distribution of height, there is a cluster of very heavy children at the top of the distribution (see appendix II, p 29) and a very marked curtailing of the distribution occurs at forty pounds. This asymmetry is emphasised by the comparison with the 'normal' distribution with the same mean and standard deviation, which continues to the level of twenty-five pounds. It is probable that there is a minimum weight below which

normal physical development is not possible, and for age eleven this weight appears to be about forty pounds. The distribution of weight varies from a 'normal' distribution more markedly than does the distribution of height. The χ^2 test gives a P value less than 0·01. To assume a 'normal' distribution for weight would lead to a serious distortion of the observed data, the heavier children being ignored and some absurdly, if not impossibly, low weights being included. Once again, however, it must be repeated that these data apply only to eleven-year-old children.

HEIGHT AND WEIGHT

The average height of Scottish eleven-year-olds is about fifty-four inches, with a standard deviation just short of three inches. About two-thirds of the children, therefore, have heights between fifty-one and fifty-seven inches. The corresponding average weight is about sixty-nine pounds, with a standard deviation of about ten pounds, so that approximately two-thirds of the children weigh between fifty-nine and seventy-nine pounds. Some comparable figures for English children have been published.[1]

TABLE IX

	Scottish		*English*	
	Boys	*Girls*	*Boys*	*Girls*
Mean Height in Inches	54·00	53·78	55·00	54·75
Standard Deviation of Height (inches)	2·81	2·94	2·5	2·8
Mean Weight in Pounds	69·72	68·35	72·0	71·0
Standard Deviation of Weight (pounds)	9·81	11·14	9·5	10·9

(These values are for age 132 months. The English means are, strictly speaking, medians, and they are given to the nearest quarter-inch and quarter-pound.)

Sutcliffe and Canham also give tables of height and weight indices, which are expressed in the same way as intelligence quotients from group-test scores, with an average of one hundred and a standard deviation of fifteen. According to these

[1] A Sutcliffe and J W Canham, *The Heights and Weights of Boys and Girls*. London: John Murray, 1950

tables, the Scottish boys have an average height 'quotient' of ninety-four, and a weight 'quotient' of ninety-seven. The height 'quotient' of Scottish girls is also ninety-four, and their weight 'quotient' is ninety-five. Table IX suggests that the Scottish children are not so well developed physically as their English contemporaries, but it is not certain that the figures are exactly comparable. The Scottish children are probably a better representation of the eleven-year-old population than the English children, the latter being selected from certain

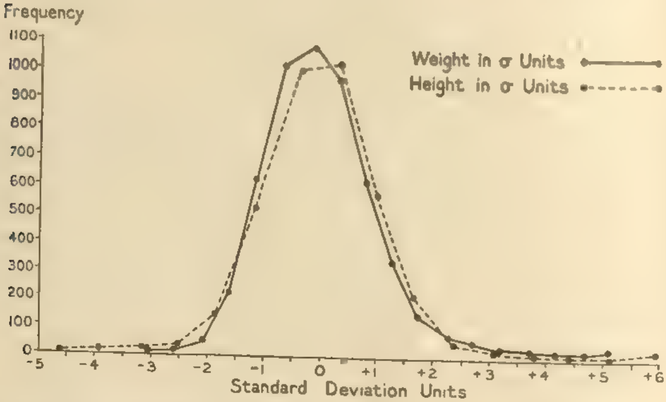

FIGURE 13 Distribution of Height and Weight in σ Units for Children Born in 1936 and Measured in June 1947

areas of England only. Allowing for different age ranges and methods of computation, there is probably little real difference between the standard deviations of height and weight for Scottish and English children. Until there are data for a comparable group of randomly-selected English children, the question of the relative physical development of Scottish and English children must be left open.

The distributions of height and weight of Scottish children are very similar in outline, as is shown in figure 13. Both distributions are somewhat more peaked than a 'normal' distribution, and both extend a considerable distance towards the top of the scale; an unusually large number of boys and girls are either extremely tall or extremely heavy, but none are both extremely tall and extremely heavy. This little cluster at the

extreme of the distributions occurs independently in height and weight, and the probability is that it is a natural feature of the distribution of heights and weights of the child population. In both distributions, also, there is an absence of a corresponding group of extremely short or extremely light children, the distribution of weight in particular coming to a rather abrupt stop at forty pounds, thus making the distribution of weight somewhat more skew than that of height. Our data lend no support to the assumption that the distribution of height or of weight is a 'normal' or Gaussian one; in fact both distributions are significantly different from a normal distribution. No inferences as to the nature of the distribution in an adult population can, of course, be drawn from this conclusion.

The rates of development for height and weight are virtually the same, about 0·6 of a standard deviation per year. The children at the age of eleven are therefore growing at the rate of about 1·8 inches and 6·5 pounds per year, though it is possible that at the age of eleven a differential rate of growth for the two sexes is becoming evident. Our data, however, do not clearly establish any such differentiation.

The correlation between height and weight is $r = +0{\cdot}693$ for boys and $r = +0{\cdot}684$ for girls. With age partialled out those values become $r = +0{\cdot}680$ and $r = +0{\cdot}672$ respectively. The two values are virtually the same; there is no evidence, therefore, of any sex difference in the relation of weight and height. In both sexes the weight tends to increase at the rate of about 2·5 pounds per increase of one inch in height. The correlation grids of height and weight (appendix table 28) exhibit a very marked degree of similarity. In both we find the same small group of extremely tall children of below average weight, and the little group of extremely heavy children of slightly above average height. The correlation coefficient of about 0·68 for both sexes indicates a fair amount of correspondence between the height and weight of most children, but it is small enough to allow for a considerable number of exceptions.

CONCLUSION

Reviewing the results obtained so far for height and weight, we find that one or two features stand out fairly clearly. Both

in height and weight the boys are on the average slightly superior to the girls; and in both there is a wider range of variability in girls than in boys. This is contrary to the usual rule in such matters, where male variability is usually greater than female variability. But it is quite consistent with our data to attribute this difference to a differential rate of physical development in boys and girls at age eleven. The distribution of neither height nor weight is normal, both distributions being characterised by the presence of a small number of extremely large heights and weights, and a corresponding absence of extremely small values at the other end of the scale. In other respects, too, the distributions of height and weight are very like each other. The correspondence between height and weight, giving a correlation $r = +0{\cdot}7$, is in general accord with the findings of other similar investigations.

The measurement of height and weight was not part of the 1932 Scottish mental survey, nor are there adequate records available of the heights and weights of eleven-year-old children in previous years. The records for children at nine and thirteen years of age in Scotland show a steady increase in average height and weight over the last few years,[1] and there is no reason to doubt that the same applies to eleven-year-olds. But this question, and the question of the relationship between height and weight and environmental conditions, must be deferred to chapter V for more detailed consideration.

[1] See ch V

APPENDIX I

Correction of Height and Weight to allow for Differences in Dates of Measurement

The group intelligence test was administered on 4th June 1947. It was intended that the heights and weights of the children should be measured as near the date of the test as was possible, but, though over two-thirds of the children were measured in June 1947, the remainder were measured over a period of thirteen months from May 1947 to May 1948 inclusive (see appendix tables 8 and 17). In the discussion that follows certain assumptions have been made: (1) that for any given month of measurement the average date of measurement is the middle of that month; (2) that there is no relationship between month of measurement and age at the date of test; (3) that, though the group of children present at the test is not precisely the same as that for whom height and weight are known, some other pupils than those absent from the test not having had their height or weight taken, the discrepancies resulting therefrom will not invalidate the comparison to any substantial degree. The data have been so classified that the labour in re-analysing them to obtain a group consistent for age, height and weight would not be justified by the small increase in accuracy so obtained.

From appendix tables 2, 8, 9, 17 and 18 we obtain:

		n	*Mean Age in Months*	*Variance of Age*
At Date of Test	Boys	3420	131·659	11·771
	Girls	3437	131·546	11·845
Height Measured in June	Boys	2553	132·157	11·446
	Girls	2669	132·071	11·884
Weight Measured in June	Boys	2557	132·158	11·462
	Girls	2659	132·072	11·913
Height	Boys	3428	132·812	15·272
All Dates of Measurement	Girls	3543	132·732	14·466
Weight	Boys	3426	132·799	15·114
All Dates of Measurement	Girls	3518	132·720	14·818

Differences between Mean Age at Date of Test and at Date of Measurement

	Boys	*Girls*
Difference in Months (Height)	1·153	1·186
Standard Error of Difference	0·089	0·087
Difference in Months (Weight)	1·140	1·174
Standard Error of Difference	0·089	0·088

There is a significant difference of just over a month between the ages of the children at date of test and at date of measurement of height and weight. We now proceed to correct the observed height and weight for this age difference to obtain an estimate of what the height and weight would have been had they been measured at the date of test.

HEIGHT

From appendix tables 8 and 9 we obtain:

	n	*Mean Height in Inches*	*Regression of Height on Age (Inches per Month)*	*Variance of Height*
Boys Measured in June	2553	54·068	+0·147 ± 0·016	7·918
Boys Measured all dates	3428	54·174	+0·142 ± 0·012	8·214
Girls Measured in June	2669	53·822	+0·151 ± 0·016	8·539
Girls Measured all dates	3543	53·958	+0·161 ± 0·013	8·968

The addition of the boys measured in months other than June does not alter significantly the regression of height on age for the June-measured boys. The difference in regression coefficients for the girls is 0·010; the standard error of this difference is 0·021. The difference is not statistically significant. The difference between the regressions for boys and girls (measured all dates) is 0·019, with a standard error of 0·018. The difference is not significant. We propose, therefore, to take the same value of 0·150 inches per month as the best estimate of the regression of height on age for both boys and girls.

Applying the correction for age, we obtain:

Mean Height at Date of Test

Boys: 54·174 − ·150 × 1·153 = 54·001 inches

Girls: 53·958 − ·150 × 1·186 = 53·780 inches

Variance (Height)

$$\text{Boys:}\quad \left[7039{\cdot}244 - \frac{(3736{\cdot}813)^2}{52351{\cdot}27}\right] \times \frac{4}{3427} = 7{\cdot}905$$

Standard Deviation 2·811 inches
Standard Error of Mean 0·048 inches

$$\text{Girls:}\quad \left[7941{\cdot}423 - \frac{(4123{\cdot}902)^2}{51239{\cdot}83}\right] \times \frac{4}{3542} = 8{\cdot}616$$

Standard Deviation 2·935 inches
Standard Error of Mean 0·049 inches

Difference of Mean Height (Boys – Girls) 0·221 inches
Standard Error of Difference (Boys – Girls) 0·07 inches

We propose to take for the boys' mean height, 54·00 ± 0·05 inches, and for the girls', 53·78 ± 0·05 inches. For the standard deviation of height, we take for the boys 2·81 inches, and for the girls 2·94 inches.

WEIGHT

From appendix tables 17 and 18 we obtain:

	n	*Mean Weight in Pounds*	*Regression of Weight on Age (Pounds per Month)*	*Variance of Weight*
Boys Measured in June	2557	69·794	+0·495 ± 0·055	90·86
Boys Measured all dates	3426	70·344	+0·558 ± 0·043	100·950
Girls Measured in June	2659	68·395	+0·545 ± 0·061	125·27
Girls Measured all dates	3518	69·004	+0·550 ± 0·049	128·419

The difference between the regression coefficients for June boys and all boys is 0·063, with a standard error of 0·070; the difference between June girls and all girls is 0·005, with a standard error of 0·078. The difference between the regression coefficients for boys and girls (measured all dates) is 0·008, with a standard error of 0·065. None of these differences is significant. We propose, therefore, to take 0·550 pounds per month as the best estimate of the regression of weight on age for both boys and girls.

Applying the correction for age, we obtain:

Mean Weight at Date of Test

Boys: 70·344 – ·55 × 1·140 = 69·717 pounds
Girls: 69·004 – ·55 × 1·181 = 68·354 pounds

Variance (Weight)

$$\text{Boys:}\quad \left[13830{\cdot}15 - \frac{(5778{\cdot}35)^2}{51765{\cdot}94}\right] \times \frac{25}{3425} = 96{\cdot}242$$

Standard Deviation 9·810 pounds
Standard Error of Mean 0·168 pounds

$$\text{Girls:}\quad \left[18071{\cdot}15 - \frac{(5725{\cdot}16)^2}{52128{\cdot}27}\right] \times \frac{25}{3517} = 123{\cdot}985$$

Standard Deviation 11·135 pounds
Standard Error of Mean 0·188 pounds

Difference of Mean Weight (Boys – Girls) 1·363 pounds
Standard Error of Difference (Boys – Girls) 0·252 pounds

We propose for the boys' mean weight 69·72 ± 0·17 pounds and for the girls' mean weight 68·35 ± 0·19 pounds. For the standard deviation of weight, we propose for the boys, 9·81 pounds, and for the girls, 11·14 pounds.

Correlation of Height, Weight, Age and Test Score

From appendix tables 2, 9, 18, 26, 27 and 28 we obtain the following correlation coefficients, all of which are positive.

v = height, w = weight, x = test score, y = age

Boys

	w	x	y
v	·693	·264	·195
w		·181	·216
x			·142

$r_{vx \cdot y}$ = ·243
$r_{wx \cdot y}$ = ·155
$r_{vw \cdot y}$ = ·680

Girls

	w	x	y
v	·684	·286	·204
w		·240	·187
x			·145

$r_{vx \cdot y}$ = ·264
$r_{wx \cdot y}$ = ·219
$r_{vw \cdot y}$ = ·672

APPENDIX II

Children more than 70 Inches in Height or more than 120 Pounds in Weight

(All Dates of Measurement)

Height in Inches	*Weight in Pounds*	*Sex*	*Date of Birth*	*Date of Measurement*	*Measured by*	*Area*
72·0	63·5	B	2· 6·36	24·6·47	Health Visitor	Small Town
74·0	54·0	G	3· 1·36	18·6·47	Health Visitor	City
74·0	52·0	B	3· 6·36	24·6·47	Senior School Medical Officer	City
75·0	53·5	B	2· 5·36	17·6·47	Health Visitor	City
76·0	56·5	G	3·11·36	24·6·47	District Nurse	Other Area
78·0	115·0	G	2· 4·36	24·6·47	Health Visitor	Small Town
79·0	81·5	B	1· 2·36	27·6·47	Health Visitor	Other Area
59·5	121·0	G	1· 4·36	24·6·47	Health Visitor	Other Area
54·5	122·0	G	1·10·36	19·6·47	School Medical Officer	Other Area
61·5	124·0	B	1· 1·36	30·5·47	Senior School Medical Officer	City
(Pituitary Defect)						
54·5	124·0	B	3·10·36	2·2·48	Teacher	City
(Hospital School)						
60·0	124·0	G	1·10·36	11·3·48	Head Teacher	Other Area
64·0	126·0	B	2· 6·36	22·3·48	Teacher	Other Area
61·0	129·0	B	1·10·36	12·6·47	Health Visitor	Other Area
54·5	129·0	G	1·11·36	9·6·47	District Nurse	Small Town
60·0	132·0	B	1· 5·36	25·6·47	Queen's Nurse	Other Area
61·0	133·0	B	2·10·36	10·5·48	Teacher	Other Area
58·5	134·5	G	3· 9·36	13·6·47	District Nurse	Other Area
(? Endocrine Defect)						
58·0	136·0	G	3. 2.36	12·6·47	Health Visitor	City
62·0	138·0	B	1· 8·36	16·7·47	District Nurse	Other Area
61·0	141·0	G	1· 1·36	17·6·47	Health Visitor	Large Town
59·0	147·0	G	3· 5·36	19·6·47	School Nurse	City
68·0	154·0	G	2· 3·36	16·3·48	Head Teacher	Other Area

All Thirty-six-day Sample

	Boys		*Girls*	
	Height in Inches	*Weight in Pounds*	*Height in Inches*	*Weight in Pounds*
Mean - - - -	54·0	69·7	53·8	68·4
Standard Deviation	2·8	9·8	2·9	11·1

It would be foolhardy to assert that there is no possibility of an error of measurement or any other type of error in the above data; but we feel confident that the majority of these heights and weights are true records, and that there is in fact such a group of boys and

girls of rather exceptional height and weight. The number in the group is unexpectedly large, and unfortunately we have no information about the pedigrees of any of these children. Whether the extreme height and weight is a more or less permanent characteristic of these children, or whether their present stature represents a temporary acceleration of growth relative to the average rate, is again unknown. For only three of the children is there any indication of other than normal physical health.

III

INTELLIGENCE AND THE SOCIAL BACKGROUND

In any examination of the relationship between intelligence and social conditions we are, of necessity, confined mainly to pupils of the thirty-six-day sample, for it is only for these children that the more extensive sociological information is available. It has, however, already been demonstrated in chapter I that these children are a typically representative sample of the total population of eleven-year-olds from which they were drawn. For group intelligence test score, a slight superiority of age is almost exactly counterbalanced by a slight inferiority in average test score. We have accordingly elected to use the group-test scores of the thirty-six-day sample uncorrected for difference of age, as these are closely similar to those of the total population; the difference of some fourteen days of age is likely to have but a negligible effect on our results.

The term 'social background' is a very wide one, and all the data that may properly be classified as sociological have not yet been analysed. The present discussion, therefore, concerns the relationships between intelligence, as measured by the group intelligence test, and such sociological factors as age, size of family, age of mother, occupational class, and occupancy rate of the home. It is therefore on home conditions that our study is at present based; the data concerning the school careers of the children are not yet fully available.

THE DISTRIBUTION OF INTELLIGENCE TEST SCORE

The distribution of the scores in the group intelligence test for both boys and girls is presented in appendix tables 1 and 2. The distribution of test scores is only approximately a normal one, the χ^2 test giving a probability of less than 0·001 that the

observed distribution is normal. The moments of the observed distribution are given below.

TABLE X

MOMENTS OF TEST SCORE DISTRIBUTION OF THIRTY-SIX-DAY SAMPLE (in Units of Five Points of Score)

	Boys	*Girls*	*All*
m_2	10·981	8·829	9·871
m_3	−10·304	−10·791	−11·011
m_4	277·925	241·888	260·788
β_1	−0·28	−0·42	−0·36
β_2	2·305	3·17	2·68
n	3420	3437	6857

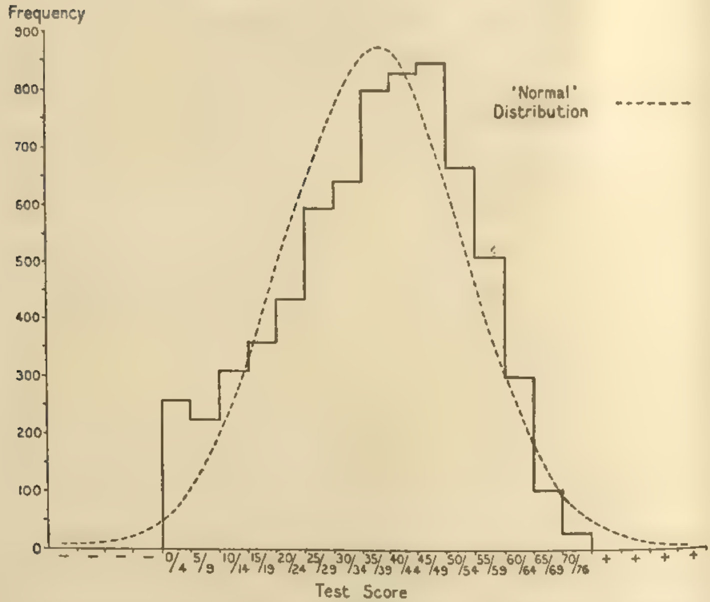

FIGURE 14 Distribution of Test Score for 6,857 Children, and 'Normal' Distribution with Same Mean and Standard Deviation

These values for the thirty-six-day sample are in agreement with those already obtained for the whole survey group. The mean score of the boys is lower than that of the girls, but the spread of score, as measured by m_2, is greater for the boys than for the girls. For both sexes the distributions are negatively skewed, the girls' slightly more so than the boys'. It is possible

that this feature is connected with the higher mean score of the girls, as the maximum possible score of seventy-six points sets an upper limit to the test. The two sexes differ also in respect of kurtosis, the boys' distribution being more platykurtic, or flatter, than that of the girls, which is slightly leptokurtic, or peaked. It must be remembered, however, that the distribution of intelligence test score does not necessarily reveal the distribution of intelligence, for the possible range of test score sets a limit to the distribution. This is most obvious at the lower end of the distribution of test score where there is a little cluster of children in the lowest group of test scores, some of whom are certainly less intelligent than others; thus a test score of zero is obtained by all children below a given level of intellectual ability, regardless of differences of ability within that group. This is quite apart from the fact that test score is determined by environmental factors as well as by innate intellectual capacity. Test score is a composite function, and we have no means of separating environmental influences from natural endowment.

TEST SCORE AND MONTH OF BIRTH

It has already been shown in *The Trend of Scottish Intelligence* that the average intelligence test score increases by about 0·67 points of score for each month of age. For the thirty-six-day sample the increase is virtually the same, being 0·69 points for boys and 0·67 points for girls.

These values are not significantly different. The regression of test score on age can fairly be represented as rectilinear. Taking the data for the whole survey group and comparing the variances due to linear regression and to deviations from linearity, we obtain table XI.

TABLE XI

ANALYSIS OF VARIANCE OF TEST SCORE BY MONTH OF BIRTH IN 1936

Variance	*Degrees of Freedom*	*Sum of Squares*	*Mean Square*
Between months	11	15364·24	—
Within months	70793	713947·59	10·085
Total	70804	729311·83	

TABLE XI—*continued*

Variance	*Degrees of Freedom*	*Sum of Squares*	*Mean Square*
Rectilinearity	1	15186·35	—
Deviations	10	177·89	17·79
Between months	11	15364·24	

Variance Ratio = 1·763; $df: n_1 = 10,\ n_2 = \infty$; $\cdot 10 > P > \cdot 05$

As a matter of interest we give below the differences between the observed means for each month, and the means estimated on a regression coefficient of $0{\cdot}68 \pm 0{\cdot}018$ points of score per month. Positive differences indicate that the observed mean is higher than the estimated mean.

TABLE XII

DIFFERENCES BETWEEN OBSERVED AND ESTIMATED MEAN TEST SCORES BY MONTH OF BIRTH

Month of Birth	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*
Difference of Means	−·54	+·17	+·21	+·35	+·23	−·09	+·08	+·14	+·18	+·14	−·08	−·33

Such differences are quite probably due to chance

The general impression obtained from this examination of the distribution of test score, and its relation to age, is that at the age of eleven there is a uniform increase of test score to the extent of about half a standard deviation per year.

TEST SCORE AND SIZE OF FAMILY

This topic has already been discussed both in *The Trend of Scottish Intelligence*, chapter VII, and in chapter I of this volume. In view of the fact that frequent reference will be made to the relationship between test score and size of family in this and succeeding chapters, a brief recapitulation may be apposite. It has been found from the survey data, both for the whole group and the thirty-six-day sample, that children with numerous brothers and sisters tend to have lower test scores than those belonging to smaller families. If we assume that the relationship between average test score and size of family is rectilinear, the average rate of decrease in average score per unit increase of family size is 2·13 points, or in terms of standard

deviation units of test score, 0·13. Though the relationship is not a simple rectilinear one, the error involved in our assumption is not large enough to distort fundamentally the observed relationship.

TEST SCORE AND AGE OF MOTHER

One of the items of information obtained about the thirty-six-day sample was the year in which the mothers of the children were born. The dates of the mothers' births cover a considerable period of years, practically all falling within the twenty-five years between 1895 and 1920. This gives an age range for the mothers, when the children were born, of forty-one to sixteen years. In the presentation of our data we have divided the mothers into five groups according to age, taking mothers over thirty-seven and under twenty-one as the two extreme groupings. The data for the children of the mothers of different ages are given below in table XIII.

TABLE XIII

Mean Test Score, Variance, Mean Size of Family and Position in Family for Age of Mother when Child was Born in 1936

Date of Mother's Birth	*Age of Mother*	*n*	*Mean Score*	*Variance*	*Mean Size* of Family*	*Mean Position* in Family*
–1899	37 +	766	35·88	276·124	4·91	4·45
1900–4	32–36	1398	37·93	268·694	4·10	3·22
1905–9	27–31	1796	38·13	259·104	3·68	2·36
1910–14	22–26	1909	35·71	249·836	3·39	1·78
1915–	21–	659	34·13	232·568	3·18	1·36
		6528				

* As in June 1947

All these mothers had an eleven-year-old child living in 1947. The mothers are not, therefore, equally representative of their generations, as the mothers of large families tend to be over-represented at the extremes of the range of mother's age. The older mothers, as shown by the data in table XIII, and in more detail in appendix table 5, are either those who have had fairly large families, of whom the survey children represent the tail end, or the mothers of smaller families whose child-bearing took place late in life. Conversely, the younger mothers of

eleven-year-old children are those whose child-bearing began at an earlier age; their children are likely to be the forerunners of a large family.

Direct comparison of the test scores of children of younger and older mothers is therefore misleading. The comparison is vitiated by the influence of size of family, and, as we shall see, by differences in social class. A fairer comparison can be made by comparing children of differently-aged mothers, for the same size of family. Table XIV, which is an extract from appendix table 5, gives the mean test scores for children of families of one to five.

TABLE XIV

MEAN TEST SCORE BY SIZE OF FAMILY BY AGE OF MOTHER

Age of Mother	*Size of Family* 1	2	3	4	5
37 +	45·9	41·7	39·6	38·4	33·8
32–36	43·7	45·3	40·1	36·4	34·4
27–31	45·5	43·7	41·4	35·4	33·0
22–26	41·3	39·9	37·8	35·2	30·8
21 –	34·9	36·0	36·7	33·6	30·3

In table XIV the influence of family size on the mean scores becomes evident. The differences in test score between the children of older mothers and those of the middle group virtually disappears. Any comparison between the children of younger mothers and the remainder is still misleading. An older mother with a family of, say, three children is not very likely to become in time the mother of a much larger family; these families of older mothers may in general be considered as completed families. With the younger mothers, where the children are the earlier-born rather than the later-born in the family, many of the families will as yet be incomplete. If the survey had been made fifteen years earlier, most of the mothers aged thirty-seven or over would have appeared in the twenty-two to twenty-six age group, with smaller families. An older mother with a family of five may be the mother of a smaller family than a younger mother with a family of five which is not yet completed. There appears a slight tendency for the scores of the children of older mothers to become increasingly superior to those of children of younger mothers as size of family increases. Though

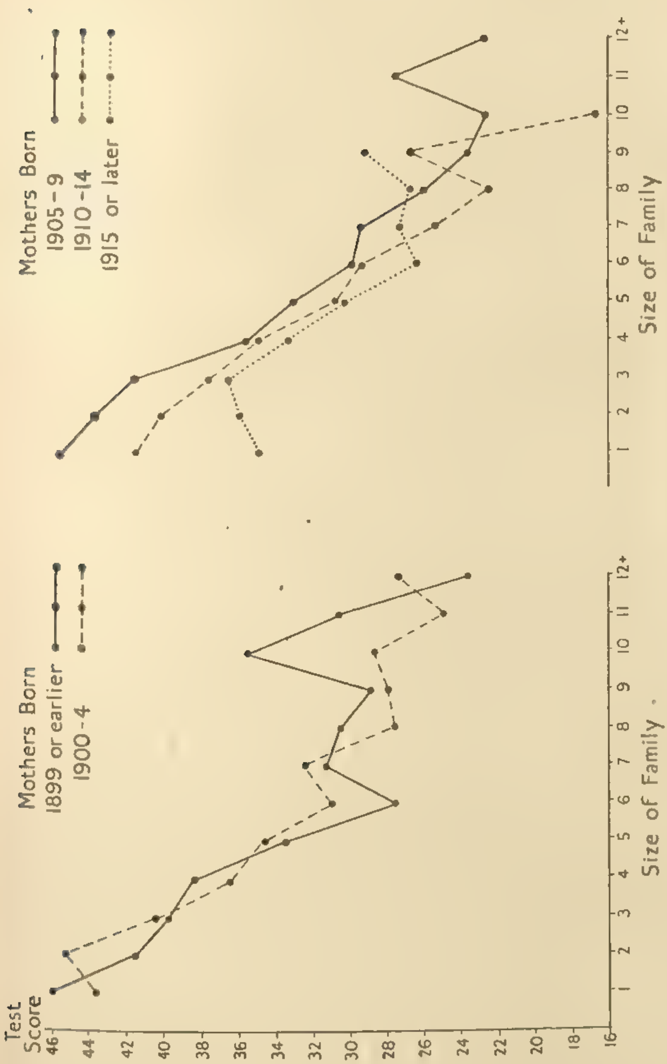

FIGURE 15 Mean Test Score by Size of Family for Date of Mother's Birth

it is tempting to interpret this as reflecting the times when large families were more uniformly distributed throughout the population than they now appear to be, it is more likely to be due to the large families of younger mothers being probably the forerunners of still larger families. We cannot, in short, infer from differences in intelligence of children of older and younger mothers any rise or fall in the average intelligence of the population over a generation, or part of a generation. It is, however, noteworthy that the tendency for average test score to become lower with increasing family size is equally evident in mothers of all ages.

Another element in the situation which makes interpretation of the results rather complicated is occupational class. Both the average test score and family size vary with the socio-economic status of the parents. The age of marriage also varies from one social level to another, the tendency being for parents in the professional class, for instance, to marry at a later age than is customary in other sections of the population. The age at marriage has in turn an obvious connection with the size of the family. In table XV is given the percentage of children in the various occupational classes according to the age of the mother. These classes may be briefly described as below.

Occupational Class	
1	Professional and large employers
2	Small employers
3	Salaried employees
4	Non-manual wage earners
5	Skilled manual wage earners
6	Semi-skilled manual wage earners
7	Unskilled manual wage earners
8	Farmers
9	Agricultural workers

These categories are more fully defined in the appendix (pp. 69-76).

There is a fair degree of similarity between the incidence of the various occupational classes for the mothers of different ages. The professional, employer and salaried classes (1, 2 and 3) are more frequently represented among the older mothers than among the younger ones; the unskilled manual workers (7)

TABLE XV

PERCENTAGE DISTRIBUTION OF OCCUPATIONAL CLASS BY AGE OF MOTHER

Occupational Class	*Mother's Age* 37 +	36–32	31–27	26–22	21–
1	3·8	5·0	4·1	1·9	0·9
2	5·0	6·4	4·8	5·0	2·2
3	3·3	4·9	4·3	2·9	1·1
4	7·9	8·4	9·3	8·3	7·2
5	28·3	31·9	39·1	40·0	37·3
6	20·0	17·9	16·3	18·3	19·5
7	20·4	16·4	13·9	16·7	23·9
8	2·5	2·5	2·5	1·3	1·1
9	8·8	6·7	5·6	5·7	6·9
	100·0	100·1	99·9	100·1	100·1

appear more frequently among the younger mothers. As the average test scores of groups 1, 2 and 3 are distinctly higher than those of group 7 and the other occupational groups, we should expect the children of the older mothers to have a higher average score (see appendix table 7). That this is not so, is probably due to the fact we have already noted, that the older mothers are not truly representative of their generation, being to a considerable extent selected by size of family.

Any attempt, based on differences between children of older and younger mothers, to infer a rise or fall in the general intellectual level is hazardous in the extreme. There are far too many cross currents, and none of the groups of mothers is truly representative of the whole population. The one consistent feature that does emerge from the data we have been discussing is the persistent tendency for average test score to diminish with increasing family size. The families of older and younger mothers belong to somewhat different occupational classes. The children of the older mothers tend to be either the later-born in large families, or children born late in the mother's life. The children of the younger mothers are those who are born early in the mother's life, and who may or may not be the earlier members of large families. But despite these differences, the children of all ages of mother show this same negative correlation between family size and test score (see

table XIV). And we shall see also that it persists through social and economic differences as well.

TEST SCORE AND OCCUPANCY RATE

In classifying the sociological data, the occupancy rate of the home was expressed in terms of the number of persons per room. These ratios were then coded in four groups, as follows:

Persons per Room	*Code Number*
Fewer than one - -	1
One and fewer than two -	2
Two and fewer than three	3
Three and more than three	4

As all the information was coded in these four groups for use on the counter-sorter, we shall throughout be expressing our data in terms of these four code numbers. Table XVI gives the test scores for each occupancy rate (see appendix table 4).

TABLE XVI

MEAN TEST SCORE AND VARIANCE BY OCCUPANCY RATE

Occupancy Rate	*n*	*Percentage*	*Mean Score*	*Variance*	$\frac{\sigma^2}{n}$
1	569	8·4	47·26	220·314	0·387
2	2843	41·9	39·27	339·022	0·119
3	2111	31·1	34·25	235·527	0·112
4	1259	18·6	30·26	255·404	0·203
	6782	100·0	36·703	262·303	0·039

Two features of table XVI invite comment. The first is the rather alarmingly high percentage of the children who live in homes which can obviously be described as overcrowded. Almost one fifth are in homes where there are three or more persons per room, which means, for example, that there are at least nine persons inhabiting a house of three rooms. By no standards, physical or social, can this be regarded as a satisfactory state of affairs; and if we were to extend this proportion to cover the school population of Scottish children between five and fifteen years old, we reach an estimate of about 125,000 school children living under such conditions of overcrowding. The deleterious effect of such conditions on the child's physical and educational development scarcely needs emphasis.

The other noteworthy feature of table XVI is the very distinct decrease in test score as the occupancy rate increases. There is little doubt that the lack of physical space and privacy associated with overcrowding will have an effect on the child's test score in various ways. The lack of room and quietness for reading or study is one such effect. But, as with the age of mother, it is not entirely safe to take these differences in test score at their face value. Other factors complicate the situation. Size of family is again one. Two fathers with the same income, one with a small family and the other with a large one, will tend to occupy homes with different occupancy rates. The general tendency appears to be for parents with increasing families not to move to larger homes unless the degree of overcrowding becomes acute, and sometimes not even then; the reasons for this tendency are probably connected with expense and security of tenure. Let us, then, examine the relationship between overcrowding and size of family. From appendix table 4 we see that for occupancy rate 1 the median family size lies between one and two children. Correspondingly for occupancy rate 2, the median lies between two and three children; for rate 3, between three and four children; and for rate 4, between four and five children. It will also be apparent that this relationship of family size and occupancy rate is not a simple one, as it depends not only on the size of the family but also on the size of the house, which in turn may be taken as a partial indication of the social and economic status of the family.

The mean test scores for each size of family within the various occupancy rates are given in appendix table 4 and represented graphically in figure 16 below. An extract from appendix table 4 is given in table XVII.

TABLE XVII

Mean Test Score by Size of Family by Occupancy Rate

Occupancy Rate	*Size of Family* 1	2	3	4	5
1	47·6	50·1	46·9	41·8	38·2
2	41·2	42·4	40·6	36·9	34·3
3	38·4	38·9	36·4	34·6	31·8
4	29·7	33·8	32·5	34·0	30·8

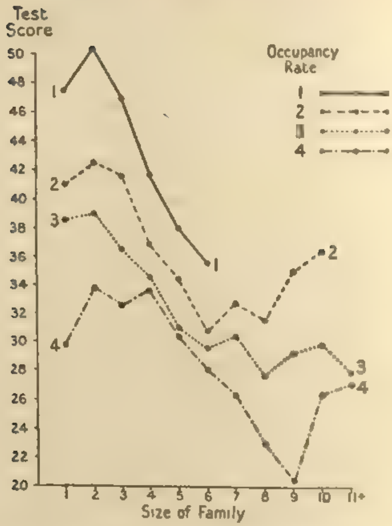

FIGURE 16 Mean Test Score by Size of Family for Occupancy Rate

For each family size, without exception, the average test score of the children decreases as occupancy rate increases. It is clear that the differences between the test scores of children in homes which are less or more crowded are not due to larger family size alone. It is also doubtful whether the relationship between test score and occupancy rate is due solely to factors of physical space and privacy. Occupancy rate is but one aspect of the social and economic complex in which the child lives. There is, for instance, a clear relationship between occupancy rate and the mother's age, as is shewn in table XVIII.

TABLE XVIII

PERCENTAGE DISTRIBUTION OF OCCUPANCY RATE BY AGE OF MOTHER

Age of Mother	*Occupancy Rate* 1	2	3	4	*Total*
37 +	9·8(81)*	46·4(385)	30·8(255)	13·0(108)	100·0(829)
32–36	11·9(178)	45·8(684)	28·7(428)	13·5(202)	99·9(1492)
27–31	9·5(184)	41·1(794)	30·5(588)	18·9(365)	100·0(1931)
22–26	5·0(104)	40·2(832)	34·3(709)	20·5(423)	100·0(2068)
21–	3·5(25)	31·3(221)	33·2(235)	32·0(226)	100·0(707)
All Ages	8·1(572)	41·5(2916)	31·5(2215)	18·8(1324)	99·9(7027)

* The figures in brackets are the numbers from which the percentages are derived.

The most favourable conditions are enjoyed by children of the older mothers. Probably the family has become economically better established, and though the families of older mothers are larger on the whole, the older members of the family may have left the home, and may even be contributing to its upkeep. The reverse will doubtless apply to the children of younger mothers. With them the degree of overcrowding is more acute. That overcrowding is a reflection of social as well as physical differences is confirmed by examination of appendix table 6. The occupancy rate clearly varies according to social class. Though, therefore, we cannot ascribe the lower test scores of children living in crowded homes to overcrowding *per se*, it is fairly clear that the social conditions, of which overcrowding is one factor, are reflected in the child's performance in the intelligence test. An investigation in Glasgow by the late Dr Shepherd Dawson[1] on 289 children removed from slum districts to a housing clearance scheme revealed after about two years an increase of approximately 1·5 points of IQ. A control group who remained in the slums showed an increase of 0·6 points of IQ. The improvement in test performance which accompanied improved housing conditions is significant but not large. To what extent the decrease in average test score with increased occupancy rate is the result of environmental influence we have no means of deciding from our data. What nevertheless again appears as a consistent feature is that, within each occupancy rate, the negative relationship between test score and family size continues to be evident.

TEST SCORE AND OCCUPATIONAL CLASS

Occupational class we have defined in terms of the occupation of the child's father. The occupations have been grouped into the nine categories previously indicated. The complete scheme of classification is given in the appendix (pp. 69-76).

The classifications of professional, farmer and agricultural worker were given priority over any other classification which may have been equally applicable; thus an agricultural worker who might also be classified as a semi-skilled manual worker

[1] *British Journal of Psychology*, General Section, XXVII, Pt 2, 1936-7, p 129

was classified as belonging to class 9 and not to class 6. Manual workers whose degree of skill could not be adequately assessed were assigned to class 6.

The distribution of the children according to the class of the father, together with their mean intelligence test scores, is given in table XIX (see also appendix table 3).

TABLE XIX

DISTRIBUTION OF THIRTY-SIX-DAY SAMPLE AND MEAN TEST SCORE BY OCCUPATIONAL CLASS

Occupational Class	*Thirty-six-day Sample*		*With Test Score Known*		
	n	*Percentage*	*n*	*Mean*	*Variance*
1	238	3·3	221	51·8	156·785
2	343	4·8	330	42·7	215·579
3	256	3·6	236	47·7	179·460
4	591	8·3	556	43·6	188·915
5	2559	35·9	2392	37·2	241·691
6	1288	18·1	1190	33·2	239·242
7	1236	17·3	1132	31·1	250·437
8	145	2·0	142	36·2	245·025
9	473	6·6	428	32·3	258·726
	7129	99·9	6627	36·786	259·069

The relationship between the average test score of the children and the socio-economic status of the father is clearly evident in the above table. The range of average test score between classes is very considerable, from fifty-one in group 1 to thirty-one in group 7, this difference of twenty points being larger than the standard deviation of sixteen points for the whole group of 6,627 children. Also, if we exclude farmers and agricultural workers, the order of the occupational classes is almost exactly the same as the order of the average test scores of the children.

These marked differences in average score should not be allowed to obscure the fact that there are many children of high intelligence in groups with low average test scores. The size of the variances is one indication of this. The distribution by occupational class of the 416 children who have scored sixty or more points on the test, constituting 6·3 per cent of all test scores, is given below in table XX.

TABLE XX

DISTRIBUTION OF OCCUPATIONAL CLASS FOR CHILDREN SCORING SIXTY OR MORE IN THE TEST (MAX. SCORE = 76)

Occupational Class	*Thirty-six-day Sample* n_1	*Scoring Sixty and More* n_2	n_2 *as Percentage of* 416	n_2 *as Percentage of* n_1
1	221	66	15·8	29·9
2	330	33	7·9	10·0
3	236	44	10·6	18·6
4	556	63	15·1	11·3
5	2392	133	31·9	5·6
6	1190	31	7·5	2·6
7	1132	24	5·8	2·1
8	142	8	1·9	5·6
9	428	14	3·4	3·3
Total	6627	416	99·9	6·3

The occupational class which contributes the largest number of these high scores is not class 1, with the highest average score, but class 5, the skilled manual workers. Similarly, though the children of the unskilled manual workers have the lowest average score, yet they include twenty-four children who are among the best 6·3 per cent in the test. The difference between the groups is not that the 'upper' social classes contribute more intelligent children to the total population; it is that a higher percentage of their children are intelligent. Almost thirty per cent of the children of class 1 are among the high scorers; only 2·1 per cent of the children of unskilled manual workers have equally high scores. Reference to the lower end of the test-score distribution illustrates the position equally clearly.[1] Only two children, less than one per cent, of class 1 score fewer than twenty points on the test, whereas 296, or 26·8 per cent, of class 7 score fewer than twenty points. It would be interesting to know how many of the 133 high scorers from the families of the manual workers will become recruits to the professional and similar occupational groups of the next generation. Common observation suggests that a number will, but exact information is lacking. The follow-up of the six-day sample should throw some light on this matter.

[1] See ch VI, p 13

But despite the overlap in the distributions of test score, the fact remains that there are very marked differences in the mean scores of children from the different occupational classes. To what extent these differences can be attributed to hereditary or environmental factors our data do not reveal. Those fathers achieving, say, professional status, will in general be of higher intellectual capacity than unskilled manual workers, and will tend to marry more intelligent wives. It is probable, therefore, that the superiority of their children in the intelligence test is partly due to native endowment. But the parents of the 'upper' social classes will also tend to provide better environments for their children. The following short extract from appendix table 36 illustrates this point.

TABLE XXI

PERCENTAGE DISTRIBUTION OF OCCUPANCY RATE FOR OCCUPATIONAL CLASSES 1, 3, 6 AND 7

Occupational Class	*Mean Test Score*	*Occupancy Rate* 1	2	3	4	*Unknown*	*Total Percentage*
1	51·8	63·2	31·8	3·3	0·4	1·3	100·0
3	47·7	32·0	53·9	13·3	0·4	0·4	100·0
6	33·2	0·9	33·6	38·3	26·4	0·7	99·9
7	31·1	1·4	31·1	37·1	29·6	0·7	99·9

Classes 1 and 3 are those in which the children have the highest average test scores, and classes 6 and 7 are those having low average test scores. The difference in the housing conditions of these children is too obvious to require comment. But the differences between the test scores of children of different occupational classes is not due to overcrowding by itself, as is demonstrated by the data in table XXII (see appendix tables 6 and 36).

Allowing for fluctuations owing to sampling where the number of children is relatively small, the general trend of table XXII is clear. For each occupancy rate the relative positions of the various occupational classes in respect of average test score remains much the same. And the tendency for the average test score of each occupational class to decrease as overcrowding increases is equally clear. Though the amount of overcrowding is clearly related to test score, that relationship is not the only

TABLE XXII

MEAN TEST SCORE BY OCCUPATIONAL CLASS BY OCCUPANCY RATE

Occupational Class	*Occupancy Rate* 1	2	3	4
1	54·4	48·0	47·6	—
2	47·7	43·0	37·2	37·9
3	51·1	48·6	36·4	—
4	49·8	45·5	44·7	40·1
5	44·9	40·3	37·9	30·8
6	36·6	35·4	33·5	30·1
7	34·9	34·1	30·4	28·4
8	40·8	32·5	30·8	—
9	35·2	32·8	32·4	27·4

(The omitted entries are those where the number of pupils is too small to ascertain a mean score)

reason for the difference in test scores among the different occupational classes.

Another factor which may be operative in these differences between the scores of children from different occupational classes is family size, which, like occupancy rate, is related to test score. Table XXIII presents the relationship between occupational class and family size.

TABLE XXIII

MEAN TEST SCORE AND FAMILY SIZE BY OCCUPATIONAL CLASS

Occupational Class	*n*	*Mean Test Score*	*Mean Family Size*	*Mean Family Size as Percentage of* 3·796
1	238	51·8	2·58	68·0
2	343	42·7	3·07	80·9
3	256	47·7	2·50	65·9
4	591	43·6	3·06	80·6
5	2559	37·2	3·61	95·1
6	1288	33·2	4·25	112·0
7	1236	31·1	4·58	120·7
8	145	36·2	3·85	101·4
9	473	32·3	4·26	112·3
All	7129	37·786	3·796	100·0

The relationship between average test score and average family size is almost perfect. Yet once more we find that, when we take each size of family separately, the general order of

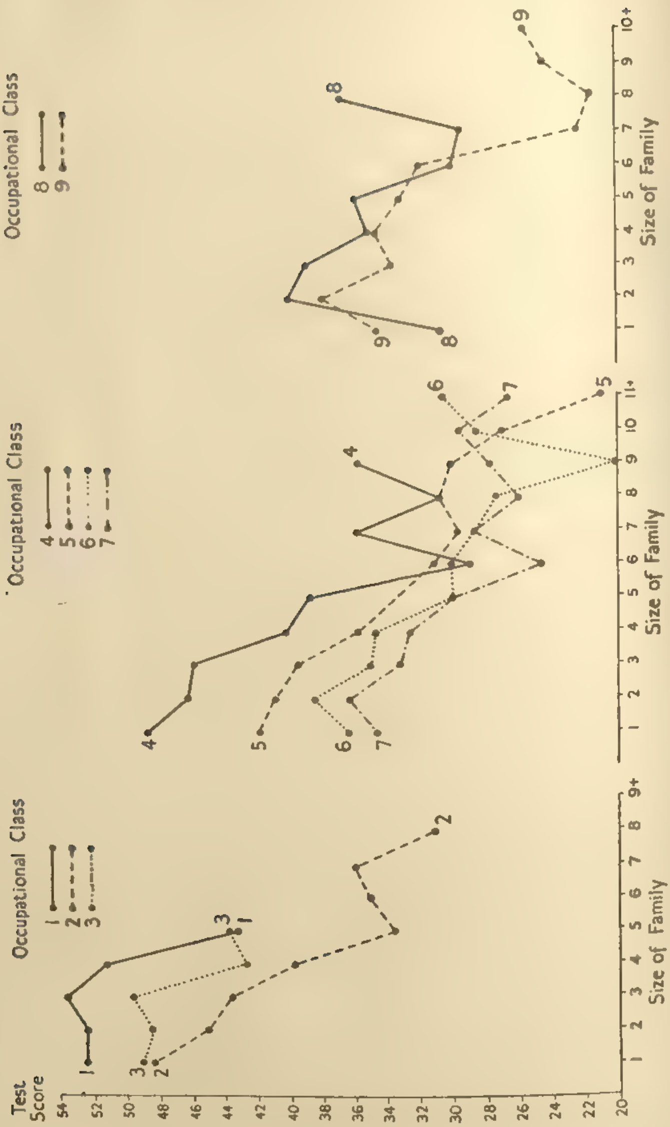

FIGURE 17 Mean Test Score by Size of Family for Occupational Class

occupational classes for test score remains much the same. The complete data are given in appendix table 3. An extract from it is given in table XXIV; figure 17 shows the same data graphically.

TABLE XXIV

MEAN TEST SCORE BY OCCUPATIONAL CLASS BY SIZE OF FAMILY

Occupational Class	*Size of Family* 1	2	3	4	5
1	52·5	52·3	53·7	51·3	43·1
2	48·3	45·1	43·7	39·7	33·5
3	48·8	48·2	49·5	42·5	43·3
4	48·4	46·1	45·7	39·8	38·6
5	41·7	40·7	39·4	35·8	33·4
6	36·2	38·5	34·8	34·4	29·8
7	34·6	36·1	33·1	32·8	29·8
8	30·3	39·9	38·7	34·7	35·8
9	34·2	37·8	33·2	34·3	32·8

Occupational classes 1 and 3 give the highest average scores throughout, and classes 7 and 9 tend to remain the lowest-scoring groups. Though large families do not appear at all frequently in classes 1 and 2, which is probably a contributory factor in the higher average scores of these groups as a whole, yet the average score of the small families in these groups is higher than that of the small families in other classes. As with overcrowding, family size is not the sole influence in determining the different levels of test score between the various occupational classes to which the children belong.

We may again note that the average test score for each occupational class shows a definite downward trend as the family size increases. This is more clearly evident in the complete tables (appendix table 3) where this trend is apparent in all occupational classes, including class 8, the farmers, for whom it is not so clearly shown in the shorter version of the tables given above.

We present finally, in table XXV, the data for the relation between test score and age of mother for each occupational class (see appendix table 7). As has already been shown in table XVI, those children from the occupational classes where the average test score is high tend to be born of older mothers.

D

TABLE XXV

MEAN TEST SCORE BY OCCUPATIONAL CLASS BY AGE OF MOTHER

Occupational Class	*Age of Mother* 37 +	36–32	31–27	26–22	21–
1	54·1	52·6	52·5	51·3	41·2
2	44·2	44·2	40·5	43·3	39·5
3	50·4	46·9	50·4	43·3	38·4
4	43·5	44·2	50·4	42·5	38·7
5	36·1	38·1	38·9	36·3	35·1
6	31·2	33·1	34·1	33·7	33·5
7	30·3	31·9	30·5	31·6	31·4
8	37·5	37·0	35·1	37·0	37·7
9	31·1	32·8	31·7	34·2	30·9
All	35·7	37·9	38·2	36·3	34·1

The number of children of mothers under twenty-two years old is very small in classes 1, 3 and 8; and though the children of the higher-scoring classes are relatively predominant in the groups of older mothers, the general order of the occupational classes for test score is much the same for all ages of mother. The age of the mother appears to have little influence on the distribution of average test score among the different occupational classes.

CONCLUSION

It is clear from the preceding data that the average intelligence test score of the children varies considerably with differences in the social aspects of their environment. Our data, however, do not reveal the extent to which these environmental conditions affect test score, or for that matter, the child's intellectual capacity. Children brought up in favourable housing conditions, in reasonably small families, whose fathers are either professional men or successful business men reach, on the average, higher scores in the intelligence test than children in less favourable circumstances. But whether this is because the children inherited a high degree of intelligence from their parents, or whether their superior performance on the test is the result of good environmental conditions, we have no means of deciding. The fairly wide range of differences in test score of children from the same type of social environment makes it

inadvisable to adopt an extreme position. Of the 334 children of unskilled manual workers living in the most overcrowded homes, thirteen have scores of more than fifty-five in the test. Similarly, six of 139 children of professional and employer fathers, living in the most commodious homes, score less than thirty on the test. The average scores of these 334 and 139 children are 28·4 and 54·4 respectively; but even with this difference there is a distinct overlap in the scores of the two groups. Differences of averages must not be allowed to obscure the fact that children of what are presumably the most intelligent parents are not all intelligent; nor are all children in the same environment equally intelligent.

Neither do our data permit us to assess the relative contributions of the different components of the child's social environment. The most marked variations in average score are probably those between most occupational classes. But the different environmental conditions do not exist independently. Overcrowding, for instance, is linked with family size, and family size with age of mother, which in turn is related to occupational class. The sociological categories we have been considering are but single aspects of the environmental complex in which the child lives, and there are many other aspects which we have not considered. The social influences which determine the child's intelligence test score tend, in short, to reinforce each other. The differences between the average test scores of children in the overcrowded and uncrowded homes is probably not a function of occupancy rate alone; it is, for instance, linked with the economic and social circumstances of the parents, so that the differences we have noted are largely due to several environmental factors all acting in the same direction, and which cannot be completely dissociated. Differences between test scores for any single environmental condition are therefore probably greater than they would be were they due to that condition alone. In an ideal physical experiment we should isolate one condition, holding all the others constant, but social factors interact and cannot be so isolated, and to break down the scores of some seven thousand children into a large number of categories would so diminish the number of children in each category that it would be extremely hazardous to draw any general conclusions

from the results. Most of our data, in addition, are such that the statistical techniques of correlation and analysis of variance are not strictly applicable.

Certain fairly definite inferences, however, can be drawn from examination of our data. One is that intelligence, as measured by the test, does vary with environmental circumstances to a considerable degree. From various investigations elsewhere, principally in the United States of America,[1] it would appear that change in environmental conditions is accompanied by a change in IQ. It is unlikely that differences in test score are due to differences in innate intellectual capacity alone. It is very probable that improvement in the environmental conditions of many of the survey children would be accompanied by an increase in their intellectual efficiency. What also requires comment is the fact that a considerable number of children living in adverse environments have nevertheless achieved high scores on the test. It is possible that these scores are not a complete indication of their intellectual potentiality, for children of equal intellectual capacity but in more favourable environments are likely to have even higher scores. Many of these children will, we hope, provide the intellectual leadership in the next generation, and it is in the interests of the community as a whole that their potential abilities should not be restricted by adverse environmental conditions. Provision is made for the further education of such children; but perhaps the time may come when education and other authorities will devote as much attention to the intellectually-gifted as they do to the intellectually-retarded.

A general conclusion from the preceding considerations is the persistence of the tendency for average test score to decrease with increase in family size. Children in overcrowded homes tend to be members of larger families, but within each occupancy rate we note this same relationship between family size and test score. The trend is equally evident for the different occupational classes and for the children of mothers of different ages. It is extremely improbable that this relationship is the

[1] F K Shuttleworth, *Journal of Educational Psychology*, vol XXVI, 1935, and Honzik, Macfarlane and Allen, *Journal of Experimental Education*, No 1, 1948

result of socio-economic differences associated with family size. It is true that the smaller families live in less crowded homes, and that the families of the 'upper' social classes are the smallest, but we still observe within the groups of children in the best social and economic environment the same trend as we observe in the poorest. The differences in social conditions probably accentuate the relationship between test score and family size, but they do not account for it.

APPENDIX III

MENTAL SURVEY 1947

SOCIOLOGICAL SCHEDULE

FOR OFFICE USE ONLY

1. Education Authority ....

2. Full name of School (in block capitals) ....

   (*a*) Official Number of School ....

3. City, Large town, Small town, Other areas ....

   Cities are: Aberdeen, Dundee, Edinburgh, Glasgow.
   Large Towns (Population over 20,000 at 1931 Census): Airdrie, Ayr, Clydebank, Coatbridge, Dumbarton, Dumfries, Dunfermline, Falkirk, Greenock, Hamilton, Inverness, Kilmarnock, Kirkcaldy, Motherwell and Wishaw, Paisley, Perth, Rutherglen, Stirling.

   Small Towns (Population less than 20,000 but over 10,000 at 1931 Census): Alloa, Arbroath, Barrhead, Bathgate, Borrowstounness, Buckhaven and Methil, Cowdenbeath, Galashiels, Grangemouth, Hawick, Irvine, Johnstone, Kirkintilloch, Montrose, Musselburgh, Peterhead, Port-Glasgow, Renfrew, Saltcoats.

4. Size of School: Average number of pupils on roll at 16th May, including all departments and classes ....

5. Number of all full-time teachers at 16th May, including Headmaster and Infant Mistress but not visiting teachers ....

6. Surname of pupil (in block capitals) ....

   Full Christian names (in block capitals) ....

7. Home address ....

   (*a*) City, Large town, Small town, Other areas ....

8. Class in school ....

   In a one-teacher school or where the number of pupils in the school is so small that there is limitation of classes, the teacher might endeavour, by consideration of the pupil's educational attainments, to determine the class for which he would be fitted under more normal school conditions, e.g. Primary III, etc.

Office use	
1.	☐☐
2. (a)	☐☐☐☐
2. (b)	☐
3.	☐
4.	☐☐☐☐
5.	☐☐
5. (a)	☐☐
7. (a)	☐
8.	☐☐

9. Date of birth: Day.................... Month.................... Year....................

10. Sex {M.................... F.................... (Mark by X)

11. Place of residence of parents when child was born ....

(a) Is child living in (or near) his birthplace? Answer Yes or No. ....

12. Position in family (expressed as fraction)....................

Fractions to be used, $\frac{1}{1}$, $\frac{1}{3}$, $\frac{4}{7}$, *i.e.* the only child, eldest of three, fourth of seven. Only full brothers and sisters now alive should be reckoned. If the child has a twin, the earlier of the two possible positions in the family should be shown. For example, if the second and third children of a family of five are twins, each of the twins should be recorded as $\frac{2}{5}$, the fourth child being recorded as $\frac{4}{5}$. Similarly, for triplets the earliest of the three possible positions in family should be given.

13. Has child a twin taking this test? If so, give name.................... and school. ....

14. Has child a brother or sister, other than a twin, born in 1936? If so, give name, date of birth and school. ....

15. Attendances during session 1946-47 to 16th May. (a) Actual: .... (b) Possible: ....

16. Number of schools previously attended....................

If the same school has been attended twice this counts as two schools. Promotion from one division to another, even when it involves a change of building, is not to be counted as a change of school, nor are Nursery Schools to be counted.

17. Has this pupil been previously tested by a group intelligence test during session 1946-47? ....

9. 10. 11. (a) 12. 13. 14. 15. (a) 15. (b) 15. (c) 16. 17. P V

Serial Number

MENTAL SURVEY 1947

RANDOM-SAMPLE SOCIOLOGICAL SCHEDULE

This schedule is for children born on the 1st, 2nd and 3rd days of each month and for all twins born in 1936.

	FOR OFFICE USE ONLY
1. Education Authority	1.
2. Full name of School (in block capitals)....................	2. (a)
(a) Official Number of School....................	2. (b)
3. City, Large town, Small town, Other areas....................	3.
Cities are: Aberdeen, Dundee, Edinburgh, Glasgow.	
Large Towns (Population over 20,000 at 1931 Census): Airdrie, Ayr, Clydebank, Coatbridge, Dumbarton, Dumfries, Dunfermline, Falkirk, Greenock, Hamilton, Inverness, Kilmarnock, Kirkcaldy, Motherwell and Wishaw, Paisley, Perth, Rutherglen, Stirling.	
Small Towns (Population less than 20,000 but over 10,000 at 1931 Census): Alloa, Arbroath, Barrhead, Bathgate, Borrowstounness, Buckhaven and Methil, Cowdenbeath, Galashiels, Grangemouth, Hawick, Irvine, Johnstone, Kirkintilloch, Montrose, Musselburgh, Peterhead, Port-Glasgow, Renfrew, Saltcoats.	
4. Size of School: Average number of pupils on roll at 16th May, including all departments and classes....................	4.
5. Number of all full-time teachers at 16th May, including Headmaster and Infant Mistress but not visiting teachers....................	5.
	5. (a)
6. Surname of pupil (in block capitals)....................	
Full Christian names (in block capitals)....................	

7. Home address .... 7. (a)

(a) City, Large town, Small town, Other areas..

8. Class in school.. 8.

In a one-teacher school or where the number of pupils in the school is so small that there is limitation of classes, the teacher might endeavour, by consideration of the pupil's educational attainments, to determine the class for which he would be fitted under more normal school conditions, *e.g.* Primary III, etc.

9. Date of birth: Day........................ Month........................ Year................ 9.

10. Sex {M........................ F........................ (Mark by X) 10.

11. Place of residence of parents when child was born.. 11. (a)

(a) Is child living in (or near) his birthplace? Answer Yes or No. ....

12. Position in family (expressed as fraction)........................ 12.

Fractions to be used, $\frac{1}{1}$, $\frac{1}{3}$, $\frac{4}{7}$, *i.e.* the only child, eldest of three, fourth of seven. Only full brothers and sisters now alive should be reckoned. If the child has a twin, the earlier of the two possible positions in the family should be shown. For example, if the second and third children of a family of five are twins, each of the twins should be recorded as $\frac{2}{5}$, the fourth child being recorded as $\frac{4}{5}$. Similarly, for triplets, the earliest of the three possible positions in family should be given.

13. Has child a twin taking this test? If so, give name.. 13.

and school ....

2

14. **Has child a brother or sister, other than a twin, born in 1936? If so, give name, date of birth and school.** ....

15. Attendances during session 1946-47 to 16th May. (*a*) Actual: ....

(*b*) Possible: ....

16. Number of schools previously attended......................

If the same school has been attended twice this counts as two schools. Promotion from one division to another, even when it involves a change of building, is not to be counted as a change of school, nor are Nursery Schools to be counted.

17. Has this pupil been previously tested by a group intelligence test during session 1946-47? ....

18. Was child evacuated?......................

(*a*) If so, to which Education Authority? ....

(*b*) City, Large town, Small town, Other areas..................

(*c*) For how long (in months)?......................

19. Is child living with his or her own mother?......................

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14. ☐

15. (*a*) ☐☐☐

15. (*b*) ☐☐☐

15. (*c*) ☐☐

16. ☐

17. ☐

18. ☐

18. (*a*) ☐☐

18. (*b*) ☐

18. (*c*) ☐☐

19. ☐

20. Occupation of father or guardian

(*a*) Describe below the KIND of work done by the father or guardian in as much detail as possible; for example, if he is an engineer, say EXACTLY what kind of engineer.

If he is retired, out of work, or dead, state his former *customary* occupation—do *not* say " old age pensioner ". If he was killed while serving temporarily in the Forces, the answer should state his occupation before he went into the Forces.

If he is temporarily in the Armed Forces—state former occupation. If no former occupation —put "Armed Forces ".

If he is a regular Sailor, Soldier or Airman—state which and give his rank.

(*b*) Is the parent or guardian

(1) An employer of 10 or more people?

or

(2) Working for himself or employing LESS than 10 people?

or

(3) Employed and earning a monthly salary?

or

(4) Employed and earning a weekly or other wage?

Put a ring round the number which applies.

(*c*) Employer's Business (if the parent or guardian is *not* himself an employer or working for himself).

20. ☐

(*a*) ....
....
....

(*c*) ....
....
....

3

Remember that it will not be possible to make an accurate assessment of the family's social class unless this question is answered fully and in detail.

Bearing the above qualifications in mind, you should see that the answers to parts (*a*) and (*b*) of Question 20 are in full detail. This is particularly important as regards Question 20(*a*). Thus, you should not accept an answer such as "engineer", "civil servant", "local government employee", "miner", "labourer", or any similar very broad description. You should ask the parent in such cases to tell you what kind of engineer (and whether professionally qualified), what rank in the civil service or in local government service, what kind of miner and doing exactly what kind of work in the mine, what type of labourer and so forth. In addition, if a father is described as a "manager" of a concern, you should try to find out (and record on the form) whether he is a manager of the concern as a whole, or a branch manager of one part of the concern—for example, a branch manager of a store in a chain-store organisation.

The following examples will give our idea of the type of detail desirable:—

CLERKS: Solicitor's Managing Clerk, Builder's Estimating Clerk, Railway Clerk.

ENGINEERING AND METAL TRADES: Loom Fitter, Textile Engineers; Pneumatic Driller, Shipbuilding; Brass Caster, Lighting Fittings; Press Stamp Operator, Aluminium Hollowware; Girder Plater, Constructional Engineering; Steel Furnaceman, Steel Rolling Mill; Iron Foundry Furnaceman; Locomotive Erector; Master Blacksmith.

FARMING: Market Gardener (Own Account); Dairy Farmer; Farm Carter; Cowman; Horseman on Farm.

LABOURERS: Riveter's Labourer, Shipyard; Permanent Way Labourer; Public Works Contractor's Labourer; Wharf Labourer; Iron Foundry Labourer; General Labourer, Brickworks; Coal Hoist Labourer; Fitter's Labourer, Motor Works.

TEXTILE OPERATIVES: Head Carder, Cotton Spinning; Fly Frame Tenter, Cotton Spinning; Artificial Silk Spinner; Overlooker, Hosiery Manufacturers.

GENERAL: Confectioner (Cake Maker); Confectioner (Sugar Confectionery Manufacturers); Wholesale Meat Salesman (Master); Tailor (Master); Butcher (Shopkeeper); Silk Merchant.

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Question 20(*b*) is not difficult to understand and should not be difficult to answer.

You should remember the following points:—

(i) The term salary (item 3) includes all salaries, monthly, quarterly and upwards, and relates to employees.

(ii) The term wage covers people who are wage earners and who receive their pay weekly, daily or at other intervals shorter than a month.

On no account, however, should you ask what is the father's income.

Question 20(*c*), which relates to employees and wage earners, asks for a statement of the employer's business or industry, and is straightforward. For example, if a man is a shop assistant, Question 20(*c*) should be answered by stating the nature of the shop or other concern for which he works—*i.e.* drapery shop, department store, etc.

21. Date of mother's birth (year only)..................................

22. Number of apartments in home..................................

To include kitchen but not bathroom.

Number of individuals in home..............................

All individuals permanently resident in the home, including any temporarily absent in the Armed Forces.

23. Height..............................inches

24. Weight..............................lbs.

Height and Weight. This should be taken to the nearest completed half inch and half pound; a statistical correction will be made for the additional height and weight. Children's height should be taken in their stocking soles, feet together, erect, and with the head able to move comfortably under the sliding measuring rod. Weight should be taken with shoes off and stripped to the waist to achieve a reasonable degree of uniformity of standard. Weighing machines should be tested prior to weighing to ensure that they are registering accurately.

Date when taken......................................

21.

22.

23.

24.

4

25. Does the child suffer from any of the following physical disabilities (check items in list)?

Disease	Mark with X
Congenital Paralysis	
Developed Paralysis	
Deafness	
Epilepsy	
Chorea	
Defective Vision	
Meningitis	
Encephalitis { Lethargica or after / Infectious Fevers	
Defects in Endocrine Glands, *e.g.* thyroid, pituitary	

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25.

P

V

M, C, Q — Individual testing

Serial number

Guide to Ascertainment of Detailed Physical Disability.

(1) *Congenital Paralysis.* It is important to know if a paralysis is congenital, as in this form there is frequently an accompanying destruction of nerve cells in the brain with a consequent mental impairment. Inquiry at the mother should be directed as to child's movements during infancy and the age at which walking commenced. It should not be difficult to decide in most cases that the paralysis is one of birth

(2) *Developed Paralysis.* This will, in most cases, be due to Anterior Poliomyelitis (Infantile Paralysis); T.B. of the spine and other less common conditions can cause paralysis. Pupils wearing casts or irons in the treatment of T.B. joints are not to be regarded as suffering from paralysis.

(3) *Deafness.* Generally, there will not be much difficulty in obtaining from parents information about deafness, although minor degrees may be passed over by parents as lack of attention on the child's part. Should there be doubt and the child is present, a reasonably accurate test is as follows: Stand the child approximately 20 feet away with his back turned, and ask him to repeat certain numbers. Ears can be tested separately by putting a finger in the ear not tested at the time. A loud whisper should be heard at 20 feet in quiet surroundings.

(4) *Epilepsy.* There is usually no difficulty in assessing this condition.

(5) *Chorea.* This should be noted if the child has had chorea at any time. Confusion must be avoided with Habit Spasm, which is a repetition of one or more muscular movements and not the widespread involuntary movements of chorea. If the child has not been confined to bed for a month or six weeks or admitted to hospital, it is unlikely to be chorea.

(6) *Defective Vision.* An accurate return of this will be difficult. Children whose error of refraction has been satisfactorily corrected by spectacles are not to be classed as suffering from defective vision. If spectacles have been supplied and are not worn (as so often happens) the child should be stated to have defective vision.

(7) *Meningitis.* Careful inquiry should elicit if the child has had meningitis. Parents often speak of their children being threatened with meningitis.

(8) *Encephalitis* (*Lethargica or after Infectious Fevers*). This will occur but rarely. A minor form of paralysis after Scarlet Fever, Mumps, Measles, etc., particularly if associated with a deterioration in school work, would indicate Encephalitis after Fevers.

(9) *Endocrine Defects.* This will usually be a sub-thyroid or more rarely cretin. Some pituitary defects may be met with.

By whom was schedule completed?

Name (Mr, Mrs, Miss)..

Designation (*e.g.* Health Visitor)..

Address..

....

Investigators should make it clear that participation in the Survey is purely optional.

GENERAL CODING INSTRUCTIONS

1. The process of coding consists of converting the information given in the sociological schedules into a system of numbers, e g, 'Boy' may be coded as 1, 'Girl' as 2. These numbers are subsequently punched on cards, so that they may be counted and sorted by machine.

2. These code numbers are to be *clearly* entered in the boxes in the right-hand margin of the schedules. The boxes are not always exactly opposite the question asked, so it is important to see that the code number is entered in the correct box. Ink is better than pencil.

3. Detailed instructions are issued on separate sheets, but the following rules apply:

(*a*) All boxes must be filled; e g, if there are three boxes and the code number is 7, the entry is 007; or if the code number is 30, the entry is 030.

(*b*) 'Direct entry' means that the number given as the answer is entered in the box; e g, 'Official number of school' is given as 103, the entry is 0103.

(*c*) If the answer is not given in the schedule and cannot be worked out from other answers, code number is X. X means 'Information not available'. *NB. This does not apply to item* 9 (*date of birth*).

4. The schedules have been divided into five sections and a separate coding instruction issued for each section. Coders, therefore, should work in groups of ten, one pair coding and checking for each section. The first of each pair should code the answer, and the second check by translating the code number back into the original answer and checking that it is correct. (For random-sample schedules, which will be coded separately, there are seven sections, and teams will therefore consist of fourteen members.)

5. These separate coding instructions give detailed directions as to code numbers to be used. *Read them very carefully and follow them exactly.*

CODING SCHEME

ORDINARY SOCIOLOGICAL SCHEDULES

Item 1. Enter code number of education authority from attached list.[1]

Item 2*a*. Direct entry: official number of school; e g, 743, code 0743.

Item 2*b*. Code all schools as 1.[2]

Item 3. City: 1; Large town: 2; Small town: 3; Other area: 4. All schools run by city education authorities are coded as 1 irrespective of the location of the school. Check that the location of the school agrees with the list given, e g, that Alloa is described as a small town. All places not given by name in the list are coded as 'other areas' irrespective of the answer given in the schedule.

Item 4. Direct entry: number of pupils on roll.

Item 5. Direct entry: number of teachers.

Where *both* the number of pupils taught at home and the number of teachers doing home teaching are entered, ignore both and enter only school pupils and teachers.

Item 5*a*. Size of class. Divide number of pupils on roll (item 4) by number of teachers (item 5), giving answer *correct* to nearest whole number.

(i) Have the arithmetic checked.

(ii) This figure is the same for the whole school. See that primary and secondary schools of the same name have different entries.

(iii) If the answer comes exactly to ·5, take the *even* whole number as the entry; e g, 51·5 is 52; 48·5 is 48.

Item 7*a*. City: 1; Large town: 2; Small town: 3; Other area: 4.

(i) Check that answer given agrees with the list in item 3, e g, that Alloa is described as 'small town'.

(ii) All places *in Scotland* not named in item 3 are 'other areas'.

(iii) Pupils whose address is given as being in *other* parts of Great Britain should be equated as nearly as possible to their Scottish equivalents (e g, Birmingham is coded as 'city'). If in doubt, code X.

(iv) Home addresses outwith the United Kingdom, code X.

[1] The education authorities were numbered from 1 to 35.

[2] Private Schools (code No 2) were done separately.

(v) If address is given as a street name only, assume it is in the same place as the school, and code accordingly.

(vi) If the school address is given as the pupil's address, code the school address.

Item 8. Class in school.[1]

The first code number is for division in school: Infants: 1; Primary: 2; Secondary: 3; Special school: 4.

The second code number is for the grade or class within the division:

1st to 5th grades: codes 1-5
Special class within division: 6
Adjustment class: 7
Class not identifiable: X

e g, (i) Primary 4 is coded 24, 1st year secondary 31, and so on.
(ii) 'Adjustment' classes are coded as 27, if in primary school.
(iii) In special schools, infants 1 and 2 and primary 1 are all coded 41.
(iv) Where class is given as, for example, primary 3-4, code the higher number.
(v) Ignore distinctions of (*a*) and (*b*) classes.
(vi) Special schools are schools for mentally or physically defective children and are usually named 'special' in item 2.
(vii) In private schools the class names may be different. Refer to supervisor.

Item 9. Date of birth: direct entry of day of month in first two boxes.

Third box for month: code as follows:
January: 1; February: 2; March: 3; April: 4; May: 5; June: 6; July: 7; August: 8; September: 9; October: 0; November: *X*; December: *Y*.

e g, (i) Child born 3rd January, code 031; 30th December, code 30*Y*.
(ii) If date of birth is unknown, draw diagonal line crossing all three boxes. *Do not use X.*
Ignore year: it is 1936 in all cases.

Item 10. Male: 1; Female: 2. If not entered, code X, unless child's Christian name clearly indicates sex, then code accordingly.

[1] The nomenclature of classes in the primary school has been changed since the date of the survey. The new practice is to number the classes upwards from I-VII, the infant division disappearing. Infants I and II become primary I and II, and primary I becomes primary III, and so on.

Item 11. Place of birth: thirty-six-day sample only. Coding same as item 7*a*.

Item 11*a*. The answers given on the schedules have been found to be inconsistent and require to be checked with the information given in item 7 and item 11. If the answer given in 11*a* does not agree with the rules below, alter it and code accordingly.

Yes: 1; No: 2;

(i) If the child has moved from any of the places named in item 3 to another named place, or to an 'other area', code 2.

(ii) If the child has moved from an 'other area' to one of the places named in item 3, code 2.

(iii) If the child has remained in an 'other area' but has moved more than ten miles from his birthplace, code 2. If you are uncertain and the place names in items 7 and 11 are different, code 2.

(iv) If *either* the pupil's home *or* birthplace is outwith Scotland but the other within Scotland, code 2.

(v) If both home and birthplace are outwith Scotland but are in different places, code 2.

(vi) If the answer to 11*a* is omitted, but can be deduced from items 7 and 11, code accordingly.

(vii) If the answer to 11*a* is clearly given, but either 7 or 11 is omitted, accept 11*a* and code accordingly.

(viii) If the answer to 11*a* is omitted and cannot be worked out, code X.

Item 12. Position in family. Use first two boxes for position in family, i e, numerator; use second two boxes for number in family, i e, denominator

e g, 3/5, code 0305; 1/1, code 0101, etc.

Item 13. Yes: 1; No: 2.

Item 14. If no answer is given, or a dash is entered, code 2. If answer is query mark (?) or 'not known', code X.

Item 15*a*. Direct entry: actual attendance. If omitted, code X.

Item 15*b*. Direct entry: possible attendance. If omitted and the child's actual number of attendances is similar to that of the other children in the same school, assume his possible attendance is the same as that of the other children and enter accordingly. If, however, the child's actual attendance is considerably different from

that of the other children in the same school, code X for possible attendance.

eg, Actual attendance: 140.
Possible of school: 340: code X.
Actual attendance: 300.
Possible of school 340: code 340.
If actual attendance is greater than possible attendance, code X for both, unless the possible attendance figure is clearly a slip of the pen; eg, entry of possible attendance is 232, possible attendance for rest of school 322.

Item 15*c*. Percentage attendance. Read off the graph provided to the nearest whole number. (This graph is not reproduced here.) If the figures are not on the graph, calculate it by dividing actual attendance by possible attendance, and multiply the answer by 100. Have your arithmetic checked.

(i) 100 per cent is coded 00.
(ii) If either actual or possible attendance is coded as XXX, code XX for percentage.

How to use the Percentage Attendance Graph:

To find a pupil's percentage attendance from the graph, find the *possible* attendance among the figures in the right or left-hand margins. Follow this along the row till you come to the column corresponding to the *actual* attendance, as given in the figures along the top of the graph. Having found this point, estimate the pupil's percentage between the diagonal lines, which give percentage attendance at 5 per cent intervals.

eg, Possible attendance: 324; Actual attendance: 312.

This point is between the 95 per cent and 100 per cent lines but considerably nearer the 95 per cent. 96 per cent is the answer though 97 per cent might be accepted as near enough. Calculation gives 96·3 per cent.

Item 16. Schools previously attended.

None: 1; One: 2; Two: 3. Three-eight or more: 4-9. Only code if a number is given: omissions, dashes, etc are coded X.

Item 17. Yes: 1; No: 2. Answer as dash, code 2. Omitted answer, code X.

P, V, Verify that these have been clearly entered and that Serial zeros have been put in blank boxes.
Number.

Check that all items in schedule have been coded. No box should be empty.

RANDOM-SAMPLE SOCIOLOGICAL SCHEDULES

Item 18. Yes: 1; No: 2. No answer or dash, code X.

Item 18*a*. Code from list of authorities. No information, code X.

Item 18*b*. City: 1; Large town: 2; Small town: 3; Other area: 4. (See item 3 for list of cities and towns.)

Item 18*c*. Direct entry in months: e g, three months, code 03; fourteen months, code 14.

(i) If the answer to 18 is coded as 2, code 0 for all boxes in 18*a*, *b* and *c*.

(ii) If the answer to 18 is coded X, code X for all boxes in 18*a*, *b* and *c*.

Item 19. Yes: 1; No: 2; No information: X.

Item 20. 1. The occupational class coding on the random-sample schedule is determined by the answers to questions 20 (*a*), (*b*) and (*c*). There will be the following codes. The classification of occupations used is derived from and is directly comparable with that used by the Population Investigation Committee in its Maternity Inquiry, and by the Royal Commission on Population in the Family Census.[1]

Code	*Brief Description*
10	Professional class
20	Employers, employing ten or more workers
30	Own account, or employing less than ten workers
41	Non-manual workers paid by monthly salary or less frequently
42	Manual workers paid by monthly salaries or less frequently
51	Clerks paid by weekly wage
52	Non-manual workers paid weekly
61	Manual workers in skilled occupations who are paid weekly
62	Manual workers in semi-skilled occupations who are paid weekly
63	Unskilled manual workers or labourers paid weekly
6x	Manual workers—skill unknown
70	Farmers
80	Agricultural workers
XX	Occupation not given

2. In the paragraphs which follow, the considerations which should guide you in allocating individuals to the different social classes are laid down. In these instructions you will find a number of the more common occupations together with their code numbers. If you are in doubt to what class a given occupation not appearing in the list should be allocated, consult your supervisor.

[1] The Maternity Inquiry in Great Britain. Population Investigation Committee and Royal College of Obstetricians and Gynaecologists. Oxford University Press Ltd, 1948

3. Professional Classes (Code 10).

This class consists of men engaged in activities for which professional qualifications are required, such as doctors, dentists, solicitors, etc. You should also include in this category the highest ranks of the civil service, local government service, and regular commissioned officers of the armed forces. School teachers should also be included in this category.

You should note that a professional qualification will supersede all others; thus a solicitor will be coded 10, whether he is an employer of people or employed himself at a salary or weekly wage.

4. Employers (Code 20).

In this category you should include men who employ ten or more persons or who are the chairmen, directors or managers of large firms (not, however, the managers of branches of chain stores, who should be classified as 41). A man with a professional classification employing more than ten people (e g, an architect, accountant or professional engineer) should be coded as professional (code 10) and *not as an employer*. A farmer, however, employing more than ten people should be coded 70, *and* not 20.

5. Own Account (Code 30).

This class covers men who work for themselves or who, though having other people working for them, employ less than ten people. Again this classification does not apply to professionally-qualified persons such as doctors, dentists, etc (who would be coded 10), or to farmers, market gardeners or farm managers (who would be coded 70). You should use your common sense in applying category 30, and not put into it people who are in reality only casually employed. For example, you may find that men with the following occupations describe themselves as working on their own account: jobbing gardeners, casually employed carpenters or bricklayers, porters at railway stations and elsewhere, car men, window cleaners, odd-job house painters and handymen, pavement artists, street musicians. Many men in these occupations belong to the type of general labourers and unskilled manual workers (code 63) and should be classified accordingly. For the purposes of this inquiry we understand the term 'own account' as indicating the small employer, shopkeeper or businessman. You should use your judgment accordingly and not code a man as 30 unless he is really of this type.

You may find that certain commercial travellers or agents who are paid by commission could also be put into this group.

6. Salaried Employees (Codes 41 and 42).

This is a very broad category, and applies to most of the men who are employed in trade, industry, central and local government, and who are paid a monthly or quarterly salary. Some kinds of employees should *not*, however, be put into these categories. Professionally-qualified employees, for instance, such as architects, doctors, solicitors, or professional engineers, should be coded 10. Managers, directors, managing directors, chairmen of companies, etc may be receiving salaries, but should be coded 20. Farm managers and bailiffs, who may be receiving salaries, should be coded 70.

Code 41 includes all shop and factory managers, whether paid monthly or weekly, also male nurses.

The types of manager who should be coded 41 are branch managers of stores and banks, managers of departments or sections of firms, and the managers of small shops and similar enterprises provided, of course, that they are in receipt of a monthly salary.

You will find that the vast majority of salary earners are doing non-manual work and should be coded 41. There may, however, be occasional cases where a manual worker may be receiving a salary, and in these cases you should code him 42. Certain industrial civil servants, for instance, and some very highly-skilled men may be paid by salary, and their code should be 42. Include in 42 officers of the Merchant Navy.

7. Non-Manual Wage Earners (Codes 51 and 52).

This category applies to a fairly wide range of occupations. If a man is paid weekly or daily wages and is not a manual worker he should in general be put into this group. It includes such workers as shop assistants, insurance agents, canvassers, clerks, the lower ranks of the civil service and local government service (excluding manual occupations such as dustmen or road-sweepers employed by local authorities), draughtsmen, policemen, warrant officers and non-commissioned officers of the regular forces, storekeepers, telegraphists, telephone operators, booking-office clerks, etc, provided they receive a weekly or daily wage. In general this class includes the lower ranks of the black-coated workers and should not include primarily manual workers or factory operatives. Nor should agricultural workers or ordinary regular soldiers, sailors or airmen be included here.

Once you have decided that a person should fall into either of these categories you can decide whether to code him 51 or 52 by finding out whether his occupation is, or is not, mainly clerical in

character. If it is, he should be coded 51, otherwise 52. Thus all persons described as clerks, booking-office, local government clerks, clerical officers or assistants, counter clerks (in the post office, or other government departments) should be coded 51, and other persons should be coded 52. 51 includes bank, railway and local authority clerks, even if salaried. 52 includes prison officers, ambulance attendants, stationmasters, entertainment artists.

8. Manual Wage Earners (Codes 61, 62 or 63).

This group (which constitutes the vast bulk of the population) will be coded either 61, 62 or 63. Everyone who is paid weekly or more frequently, and who is a manual worker (with the exception of agricultural labourers) will be put into one of these groups. Altogether you will find that between fifty-five and sixty per cent of the population will fall into these groups.

The criterion by which you should decide whether a man belongs to group 61, 62 or 63 is whether his occupation involves any degree of skill, and whether training or apprenticeship is necessary for it. Code 62 includes technicians such as machinists whose exact job is undefined.

Class 61 comprises all manual occupations which require apprenticeship or skill. All craftsmen such as carpenters, plumbers, compositors, bricklayers, painters, etc are to be included in it. Such occupations are given in the attached list. If you are in doubt whether a particular occupation should be included in group 61, ask yourself whether the work consists of mere machine minding which can be picked up very quickly, or whether it requires skill and training. If the latter is the case, you should code the occupation 61.

The distinction between 62 and 63 is more difficult. It is best to regard class 62 as a residual class in which all manual wage-earners who do not come into 61 or 63 are put, as these two classes are most easily defined. It will therefore be best to consider class 63 first, and indicate later the type of occupation which would fall into class 62.

Class 63 consists of those occupations for which no specialised skill or training is required. All types of labourer, for instance, should be included here, as should hawkers, watchmen, scavengers, lift attendants, porters, car-park attendants and the like. Only occupations which are completely unskilled should be included here.

The remainder of manual wage-earners will be in group 62. This class will include the machine-minders and general semi-

skilled occupations such as factory operatives, bus conductors, lorry drivers, cinema attendants, barmen, and the like.

A list of occupations in classes 10, 61 and 63 is attached.

9. Farmers (Code 70).

This category applies to employers, managers, and people working on their own account (usually with the help of family labour) in agriculture and forestry. It includes such specialised forms of agriculture as cattle farmer, dairy farmer, horse breeder, stud farmer, strawberry grower, turkey breeder, chicken raiser and small-holder and market gardener, provided that the person concerned is the farmer himself or his manager. Farm bailiffs and estate managers (that is agricultural estates, *not* estate agents in towns) should be put into this class, and so should persons who describe themselves as 'farmer's sons' or 'grandsons'. You should not, however, include 'crofter' in the northern counties and islands in this category; they should be included under 80.

10. Agricultural Workers (Code 80).

This category covers all persons (other than those employed as managers) working in agricultural and forestry occupations. You should include farm labourers of all descriptions (including general labourers on farms), foresters and woodmen, threshing-machine workers, gamekeepers, horse grooms, dairy hands and so forth. You should not, of course, include professionally-qualified workmen (for instance, agricultural research chemists), for they should be classified in code 10.

Crofters in the northern counties and the islands should also be put into this category. You may find some persons who describe themselves as 'crofters and fishermen'. These should be included in this code, although a fisherman is not ordinarily counted as an agricultural worker. If crofting is subsidiary to another occupation, code main occupation.

LIST OF OCCUPATIONS IN CLASSES 10, 61 AND 63

Professional (Code 10)

Accountant
Actuary
Administrative civil servant
Advocate
Aeronautical engineer (qualified)
Analytical chemist
Apothecary
Architect
Artist
Assistant master
Assistant Principal (civil service)
Assistant Secretary
Attorney-at-Law
Author

Professional (Code 10)—*continued*

Bacteriologist
Barrister-at-Law
Biologist
Botanist

Chartered accountant
Chief constable
Civil engineer (qualified)
City Treasurer
Clergyman
Clerk in Holy Orders
Commissioned regular officer
Critic

Dental surgeon
Dentist
Director of Education

Economist
Electrical engineer (qualified)
Entomologist

Geographer
Geologist
Gynaecologist

Head Master

Incorporated accountant

Journalist

King's Counsel

Land agent
Lecturer
Librarian

Mechanical engineer (qualified)
Medical Officer of Health
Medical practitioner
Metereologist
Mining engineer (qualified)

Minister of religion
Municipal Treasurer

Naval architect

Obstetrician
Oculist
Ophthalmic surgeon
Optician

Pharmaceutical chemist
Parliamentary agent
Pathologist
Physician
Physicist
Physiologist
Principal (civil service)
Principal Assistant Secretary
Principal (College or University)
Psychiatrist
Psychologist

Research worker

Schoolmaster
Scientist
Solicitor
Statistician
Surgeon
Surveyor

Teacher
Town Clerk

Under Secretary (civil service)
University lecturer
University professor
University reader

Veterinary surgeon

Writer to the Signet

Class 61

Baker
Basketmaker
Boiler-maker

Bookbinder
Boot-repairer
Brass finisher

Class 61—*continued*

Brass moulder
Bricklayer
Brushmaker

Cabinetmaker
Carpenter
Chef
Compositor
Confectioner
Cooper
Coppersmith
Currier
Cutler

Die-cutter

Electric welder
Electro-plater
Engine driver
Engraver

Fitter
French polisher

Gas fitter
Glazier
Goldsmith
Gunsmith

Hairdresser
Hatter

Instrument maker
Iron moulder

Japanner

Lens surfacer
Lithographer
Locksmith

Mason
Millwright

Oven-builder

Painter
Photographer
Piano tuner
Plasterer
Plumber
Press maker
Printer
Puddler

Rat catcher
Riveter

Saddler
Safe maker
Shipwright
Signalman
Sign-writer
Smith
Spinner

Tailor
Tiler
Toolmaker
Turner
Type-caster

Undertaker
Upholsterer

Varnish-maker

Watchmaker
Weaver
Wheelwright
Working engineer

Class 63

Costermonger

Docker
Dustman

Hawker

Labourer (except riveter's plumber's)

Class 63—*continued*

Lift attendant

Mate (of skilled craftsmen, except plumber, plater's helper, labourer)

Messenger

Navvy

Porter

Rag-and-bone man

Scavenger

Watchman

This list does not pretend to be exhaustive, but gives an indication of the types of occupation which fall into these classes.

Item 21. Enter the last two figures of mother's year of birth, e g, 1908, code 08; 1894, code 94.

Item 22. Enter *code number* from the table supplied. If the number of persons or apartments is not covered by the table, divide the number of persons by the number of apartments and code according to the following:

Number of Persons per Room	*Code Number*
Fewer than one - - -	1
One and fewer than two -	2
Two and fewer than three -	3
Three or more - - -	4

If there is not enough information, code X

		Number of Individuals											
		1	2	3	4	5	6	7	8	9	10	11	12
Number of Rooms	1	2	3	4	4	4	4	4	4	4	4	4	4
	2	1	2	2	3	3	4	4	4	4	4	4	4
	3	1	1	2	2	2	3	3	3	4	4	4	4
	4	1	1	1	2	2	2	2	3	3	3	3	4
	5	1	1	1	1	2	2	2	2	2	3	3	3
	6	1	1	1	1	1	2	2	2	2	2	2	3

Note: The numbers in the body of the table are the *code* numbers and are entered directly on to the schedules

Item 23. Direct entry of height in inches.

Item 24. Direct entry of weight in pounds.

Item 25. Number the disabilities as follows:

1 Congenital paralysis
2 Developed paralysis
3 Deafness
4 Epilepsy
5 Chorea
6 Defective vision
7 Meningitis
8 Encephalitis
9 Defects in endocrine glands

(i) If the child has no disabilities marked, code 0 in all boxes.

(ii) If the child has one disability, code the disability number in the third box, 0 in other boxes.

(iii) If the child has two disabilities, code the number of the first disability in the third box, the number of the second disability in the second box, and 0 in the first box.

(iv) If the child has three or more disabilities, enter the first three in the boxes.

P, V and Serial Number — Check that these have been entered. If there is no entry in P and V, enter X in all three boxes. If the serial number has been omitted, hand in the schedule separately.

M C Q — In the case of the pupils born on the first day of the even months, who were individually tested, M and C are the mental and chronological ages in months, and Q is the intelligence quotient.

Note on item 20:

In the text of this volume the code numbers used for the occupation of the pupils' fathers have been grouped into nine occupational classes. The conversion from the coded father's occupation to occupational class is as follows:

Code (*See p* 69)	*Occupational Class*
10, 20	1
30	2
41, 42	3
51, 52	4
61	5
62, 6x	6
63	7
70	8
80	9

IV

HEIGHT AND WEIGHT: THE SOCIAL BACKGROUND

In chapter III we examined the relationship between intelligence test score and certain aspects of the social conditions in which the children were living at the time of the survey. In the present chapter we shall examine these same conditions in relation to the physical development of the children as represented by their heights and weights. There are 3,428 boys and 3,543 girls in the thirty-six-day sample whose height and age are known, and 3,426 boys and 3,518 girls whose weight and age are both known. Of the 6,971 children with known height and the 6,944 with known weight, over 6,900 are the same children, and in each of these two groups of children the great majority have their test scores recorded as well. The data for height, weight, and test score are derived from what is virtually the same set of children.

HEIGHT, WEIGHT AND SIZE OF FAMILY

It was a clearly marked feature of the group intelligence test scores that the children with a large number of brothers and sisters obtained a lower average score than did those in smaller families. The same feature appears for both height and weight. The distribution of average height and weight by family size is given in table XXVI (appendix tables 10 and 19), and the same data are represented graphically in figures 18*a* and *b*.

The regression of height and weight on family size has been assumed to be linear, and though it is not actually so, the error involved does not seriously distort the relationship. In round figures, the standard deviation of the distribution of height for all the children, regardless of family size, is just under three inches, and the rate of decrease in average height per unit

TABLE XXVI

MEAN HEIGHT AND MEAN WEIGHT BY SIZE OF FAMILY

Size of Family	*Mean Height in Inches*				*Mean Weight in Pounds*			
	n	*Boys*	*n*	*Girls*	*n*	*Boys*	*n*	*Girls*
1	383	54·9	397	54·8	380	72·1	396	72·4
2	743	54·9	786	54·7	741	71·7	780	70·4
3	718	54·3	723	54·1	722	70·9	721	69·1
4	573	53·9	545	53·8	570	69·5	543	68·5
5	357	53·8	374	53·4	358	69·3	371	67·8
6	242	53·5	241	53·0	243	68·8	240	66·6
7	156	53·2	176	53·2	155	68·7	170	67·1
8	106	53·0	117	52·7	107	68·5	115	65·6
9 and over	128	53·3	156	52·8	128	67·8	154	66·2
All	3406	54·2	3515	54·0	3404	70·3	3490	69·0

	Boys	*Girls*
Regression of height on family size	–0·26 inches	–0·28 inches
Regression of weight on family size	–0·58 pounds	–0·74 pounds

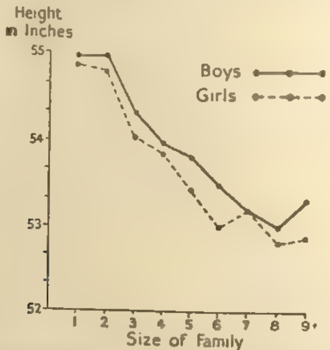

FIGURE 18*a* Mean Height by Size of Family

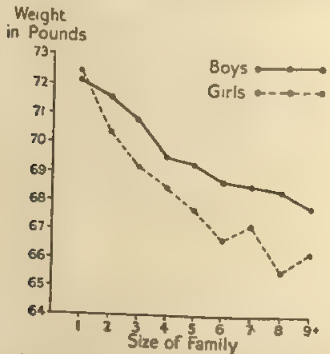

FIGURE 18*b* Mean Weight by Size of Family

increase in family size is of the order of 0·27 inches. Similarly, the standard deviation for weight is about ten pounds, and the corresponding rate of decrease for increasing family size is about 0·65 pounds. The rate of decrease by family size is thus relatively greater for height than for weight. Though the decrease in mean height and in mean weight is not so marked as in test score, the downward trend in physical size is clearly present. This trend also is more apparent in girls than in boys. This phenomenon may be connected with the tendency for the taller and heavier girls to outstrip the boys about the age of eleven. As the children in the smaller families appear to be on the average taller and heavier than the others, it is not improbable that this superiority of the girls should first become evident in the smaller families. On the other hand, it may be that the physique of the girls, particularly in weight, responds more readily to the comparatively favourable environmental conditions associated with small families. But before any conclusion, even a tentative one, can be reached, further examination of the relation of physique to environmental conditions is necessary.

HEIGHT, WEIGHT AND AGE OF MOTHER

Dividing the children into five groups according to the age of mother at the birth of the child, we obtain the average heights and weights of the children as given in table XXVII (see also appendix tables 13 and 22).

A certain tendency for children of older mothers to be taller and heavier than children of younger mothers is apparent. The dividing line seems to be about the age of twenty-six. The variance of weight for the children of older mothers is also greater. No clear inference is deducible. There is a decrease in average height and weight with increasing family size, as witness table XXVIII, but it is the older mothers who have the larger families. Also, this decrease in average height and weight by family size is accompanied, within each family size, by the same distinction between the heights and weights of children of the older and younger mothers as appears in the group as a whole. A further complication is the likelihood that the families of the younger mothers are incomplete, and the fact that the socio-economic level of the older mothers is generally higher

TABLE XXVII

MEAN HEIGHT IN INCHES BY AGE OF MOTHER AT BIRTH OF CHILD

Age of Mother in Years	*Boys*			*Girls*			*Both*		
	n	*Mean*	*Variance*	*n*	*Mean*	*Variance*	*n*	*Mean*	*Variance*
37 +	398	54·35	8·20	394	54·16	10·11	792	54·25	9·16
32-36	677	54·51	7·32	752	54·07	8·94	1429	54·28	8·22
27-31	917	54·29	8·03	911	54·11	9·08	1828	54·20	8·56
22-26	963	54·02	8·50	1013	53·77	8·44	1976	53·89	8·49
21 –	346	53·18	8·61	334	53·58	7·65	680	53·23	8·19
	3301			3404			6705		

MEAN WEIGHT IN POUNDS BY AGE OF MOTHER AT BIRTH OF CHILD

Age of Mother in Years	*Boys*			*Girls*			*Both*		
	n	*Mean*	*Variance*	*n*	*Mean*	*Variance*	*n*	*Mean*	*Variance*
37 +	399	70·57	105·83	394	71·07	173·29	793	70·82	139·41
32-36	678	71·11	113·09	747	69·13	135·32	1425	70·07	125·88
27-31	913	71·08	98·94	908	69·13	116·71	1821	69·96	108·49
22-26	964	69·84	82·59	1011	68·16	121·58	1975	68·98	103·25
21 –	343	68·18	98·62	332	67·96	99·12	675	68·07	98·92
	3297			3392			6687		

TABLE XXVIII

MEAN HEIGHT IN INCHES BY SIZE OF FAMILY FOR AGE OF MOTHER AT BIRTH OF CHILD

Age of Mother in Years	*Size of Family* 1	2	3	4	5
37 +	55·4	55·2	54·1	54·4	54·7
32-36	54·6	55·0	54·4	53·8	53·6
27-31	55·3	55·0	54·5	54·0	53·2
22-26	54·7	54·5	53·9	53·6	53·3
21 –	53·6	53·7	53·6	53·1	53·0

MEAN WEIGHT IN POUNDS BY SIZE OF FAMILY FOR AGE OF MOTHER AT BIRTH OF CHILD

Age of Mother in Years	*Size of Family* 1	2	3	4	5
37 +	74·1	72·9	70·5	71·7	71·6
32-36	71·5	72·5	71·2	70·2	68·8
27-31	73·8	71·5	70·6	68·5	68·8
22-26	72·4	69·6	69·1	68·1	67·1
21 –	68·8	68·6	68·5	66·9	65·7

than that of the younger mothers. It may be that the better social conditions, combined with the larger families of the older mothers result in the greater variance of the heights and weights of their children, but it is not clear how these factors affect the higher average. The variations in intelligence of children of older mothers are different from the variations in height and weight. Possibly the children of older mothers grow more rapidly than others.

As the size of family is closely connected with the mother's age, the relevant data are given in table XXVIII, which is an extract from appendix tables 16 and 25.

The relationship between the heights and weights of children of mothers of different ages remains substantially the same for each size of family. And once more the tendency for mean height and weight to decrease in the larger families is apparent.

HEIGHT, WEIGHT AND OCCUPANCY RATE

The decline in average intelligence test score with increasing occupancy rate is paralleled by a similar decrease in average height and weight. The data are given in table XXIX (appendix tables 12 and 21). Occupancy rate, as explained before, is the ratio of the number of persons in the home to the number of rooms, the categories being:

Persons per Room	*Code Number*
Fewer than one - - -	1
One and fewer than two -	2
Two and fewer than three	3
Three and more than three	4

The differences between the heights and weights of children living in the most and the least crowded homes are considerable. The children living in homes where there are three or more persons per room are on the average about two and a half inches shorter and seven pounds lighter than those living in the most spacious homes. Though it may not be entirely legitimate to attribute these differences to overcrowding alone, there can be little doubt that the lack of space and the generally less satisfactory physical conditions in an overcrowded home will have an adverse effect upon the child's physical development. There are nevertheless other elements in the situation. The incidence

TABLE XXIX

Mean Height in Inches by Occupancy Rate

Occupancy Rate	*Boys* *n*	*Mean*	*Variance*	*Girls* *n*	*Mean*	*Variance*
1	288	55·65	7·49	297	55·39	8·74
2	1427	54·48	7·92	1444	54·33	8·45
3	1034	53·89	7·60	1115	53·67	8·86
4	651	53·27	7·72	656	52·75	7·98
Unknown	28	54·75	8·59	31	54·30	10·32
All	3428	54·17	8·15	3543	53·96	8·97

Mean Weight in Pounds by Occupancy Rate

Occupancy Rate	*Boys* *n*	*Mean*	*Variance*	*Girls* *n*	*Mean*	*Variance*
1	285	75·29	145·09	293	73·13	152·66
2	1425	71·11	98·26	1434	70·16	141·00
3	1036	69·45	91·39	1106	67·37	102·80
4	652	67·86	81·34	654	65·93	108·11
Unknown	28	72·25	138·36	31	71·77	144·93
All	3426	70·35	100·92	3518	69·00	128·45

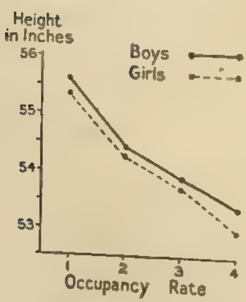

Figure 19*a*
Mean Height by Occupancy Rate

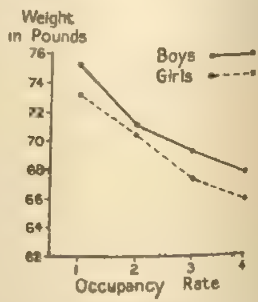

Figure 19*b*
Mean Weight by Occupancy Rate

of overcrowding, for instance, is greater in the cities. Nearly a quarter (twenty-three per cent) of the city children live in overcrowded homes, as compared with seventeen per cent in the large burghs, eighteen per cent in the small burghs, and fifteen per cent in other, that is, mainly rural areas. Overcrowding is to some degree an urban phenomenon; about half the children who live in badly overcrowded homes are to be

found in the four cities, though only forty per cent of all children are city dwellers. The city children are, on the average, about half an inch shorter and two and three quarter pounds lighter than those living elsewhere. It is probable that the city child who lives in an overcrowded home has not the compensatory advantages of outdoor space, fresh air and better feeding that are the lot of most rural children. The physical inferiority of the city children can be accounted for only in part by the greater frequency of overcrowding in the cities. The differences in height and weight between city and other children are very much less than those between children living in the most and the least crowded homes, whether these homes be in the city or not.

The occupancy rate also depends to some extent on the size of the family. We must therefore consider whether the differences of physique associated with overcrowding are not largely attributable to the larger families having to live in more crowded homes.

The complete data are given in appendix tables 15 and 24, from which table XXX is an extract.

TABLE XXX

Mean Height in Inches by Size of Family by Occupancy Rate

Occupancy Rate	*Size of Family* 1	2	3	4	5
1	55·7	55·7	55·4	54·6	54·8
2	54·7	54·8	54·4	54·0	54·1
3	54·1	54·6	53·8	53·9	53·5
4	53·4	53·5	53·4	53·5	52·9

Mean Weight in Pounds by Size of Family by Occupancy Rate

Occupancy Rate	*Size of Family* 1	2	3	4	5
1	74·7	74·5	75·5	72·1	73·3
2	71·9	71·2	70·5	70·0	70·1
3	69·4	70·2	68·7	68·7	68·0
4	69·4	67·3	67·7	67·9	66·9

The difference in average height and weight, for each family size, between children in the most and least crowded homes is not quite so great as it was for all children irrespective of size of family; but the difference is still a considerable one, indicating

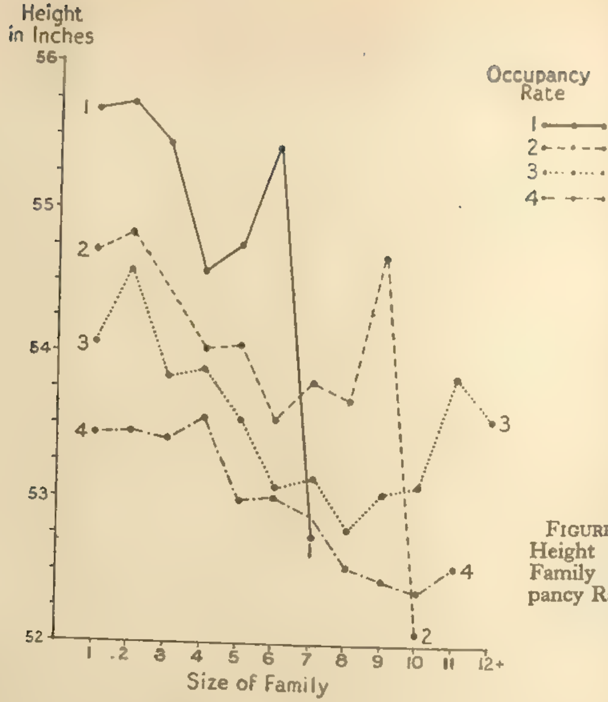

FIGURE 20*a* Mean Height by Size of Family for Occupancy Rate

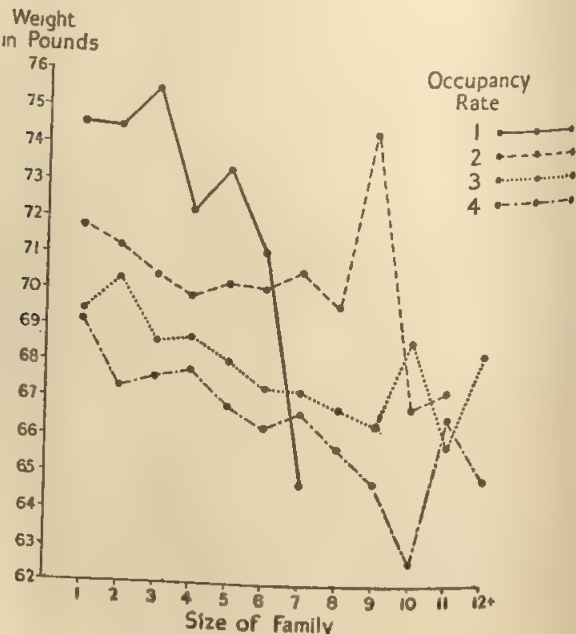

FIGURE 20*b* Mean Weight by Size of Family for Occupancy Rate

that the effects of overcrowding are largely independent of size of family. For each size of family the average height and weight of the children living in the less crowded homes remain almost uniformly greater than those of the children in the more crowded homes. The tendency for average height and weight to become less in the larger families is also apparent, though the curves in figures 20*a* and 20*b* tend to fluctuate somewhat in the larger family sizes, where the numbers of children are comparatively small.

HEIGHT, WEIGHT AND OCCUPATIONAL CLASS

The classification of the families by occupational class is based on the father's occupation. The groups are those used previously, namely:

Occupational Class	
1	Professional, and employers of ten or more workers
2	Self-employed, and employers of less than ten workers
3	Salaried employees
4	Non-manual wage-earners
5	Skilled manual wage-earners
6	Semi-skilled manual wage-earners
7	Unskilled manual wage-earners
8	Farmers
9	Agricultural workers

The differences in average physique between children from the various occupational classes are not inconsiderable. The sons of the professional and employer group of parents are about three inches taller and eight pounds heavier than the sons of unskilled manual labourers. The girls, similarly, are about two and a half inches taller and six pounds heavier. The differences are of the same order as we found between the children in the most and least crowded homes. These two phenomena are not, of course, entirely independent; there is less overcrowding in the 'upper' occupational classes.

The distribution of average height and weight among the occupational classes is very similar to the distribution of mean intelligence test score. Though both height and weight are positively correlated with test score, the correlation is not a large one, and is not sufficient to account for the close resem-

blance in the way that both physique and intelligence vary with environmental conditions. It is likely that the more favourable environmental conditions of the 'upper' occupational classes have much the same kind of influence on physical development

TABLE XXXI

MEAN HEIGHT IN INCHES BY OCCUPATIONAL CLASS

Occupational Class	*n*	*Boys* *Mean*	*Variance*	*n*	*Girls* *Mean*	*Variance*
1	116	56·20	6·36	113	55·42	7·26
2	171	54·81	8·30	162	54·75	8·64
3	122	55·91	5·76	122	54·83	9·67
4	252	55·06	8·84	307	54·56	10·97
5	1211	54·15	7·72	1231	53·97	8·22
6	592	53·66	7·49	632	53·51	8·61
7	594	53·17	7·58	597	53·07	7·44
8	68	54·96	7·43	71	54·52	9·08
9	226	54·33	8·74	216	54·82	9·59
All	3352	54·15	8·26	3451	53·96	8·93

MEAN WEIGHT IN POUNDS BY OCCUPATIONAL CLASS

Occupational Class	*n*	*Boys* *Mean*	*Variance*	*n*	*Girls* *Mean*	*Variance*
1	115	76·21	98·48	113	72·56	147·04
2	172	72·25	163·95	160	72·56	211·15
3	121	74·94	127·70	121	71·34	119·01
4	252	72·55	112·71	305	69·61	141·80
5	1213	69·79	86·50	1224	68·54	112·30
6	593	68·62	80·36	629	67·90	111·30
7	595	68·06	78·59	596	66·53	105·02
8	66	74·14	141·49	70	73·39	147·98
9	222	73·06	121·19	210	73·08	164·19
All	3349	70·32	100·07	3428	68·96	127·49

(See appendix tables 11 and 20)

as they have on intellectual development. Once again, our data do not enable us to disentangle hereditary and environmental factors; but we may note that the children of farmers and agricultural workers take a higher place in respect of physique than they do in test score. It is very probable that this relative superiority in physique is not unconnected with the beneficial influ-

ence of a rural environment, especially during a period of food shortage in time of war.

We have already observed that the average family size varied from one occupational class to another. The mean heights and weights of children from different sizes of families for each occupational class are given in tables XXXII and XXXIII. The complete data appear in appendix tables 14 and 23.

TABLE XXXII

MEAN HEIGHT IN INCHES BY SIZE OF FAMILY BY OCCUPATIONAL CLASS

Occupational Class	*Size of Family* 1	2	3	4	5
1	55·7	56·1	55·3	56·1	55·5
2	55·2	55·6	54·7	54·3	55·0
3	55·2	55·6	55·6	54·5	55·0
4	55·6	55·4	54·7	54·2	53·2
5	54·7	54·6	54·1	53·8	53·6
6	54·6	54·5	53·6	52·2	53·1
7	54·2	53·5	53·5	53·4	52·8
8	54·9	55·1	55·0	53·5	55·1
9	54·3	55·1	54·8	54·5	54·7

TABLE XXXIII

MEAN WEIGHT IN POUNDS BY SIZE OF FAMILY BY OCCUPATIONAL CLASS

Occupational Class	*Size of Family* 1	2	3	4	5
1	75·7	75·0	72·9	74·4	74·6
2	73·3	73·8	74·2	70·5	73·8
3	73·3	73·4	73·8	70·8	72·0
4	74·0	72·1	70·8	69·4	69·4
5	71·2	70·1	68·9	68·6	68·3
6	72·2	70·1	68·4	69·0	67·6
7	69·8	68·0	68·1	67·7	66·3
8	77·7	72·6	76·2	70·2	73·4
9	73·0	72·3	75·3	71·5	74·6

Within each size of family the relationship of physique and occupational class is not radically changed, though certain variations, due doubtless to sampling, do occur. The same applies to the relationship between physique and size of family within each occupational class; the downward tendency of mean height and weight with increasing family size is again present, this tendency being still more marked when the larger family sizes are included. A certain amount of the differences between

occupational classes is probably due to their differential fertility, but by no means all of the differences between the groups can be accounted for by this factor. The children in certain occupational groups remain taller and heavier than the others, whatever the size of the family to which they belong.

CONCLUSION

When we review the data presented in this chapter, certain fairly distinct conclusions emerge. The average heights and weights of the eleven-year-old group tested vary quite considerably according to the social and physical conditions in which they live. Though we have no information about the physique of the parents of these children, it would be adopting a very extreme point of view to maintain that the physical development of the children is unaffected either by a home in which there are three or more persons per room, or by the more favourable conditions which can be provided by parents whose economic and social status is above the average. It is the amount of the difference between the physiques of children from the most and the least favourable environments that is noteworthy.

It is also clear from our data that there is a negative correlation between height and weight and family size. This is not quite so marked as it is with intelligence test score, but there is no doubt about its presence. And it does not appear to be the result of the correspondence between family size and age of mother, occupancy rate, or occupational class; the tendency for children of larger families to be shorter and lighter persists through all ages of mother, all occupancy rates, and all levels of fathers' occupation.

In this, and in other respects, there is a very close parallel between the data for height and weight and for intelligence test score. Both physique and intelligence appear to vary in much the same way according to family and environmental circumstances. This similarity raises a number of points of interest which require a separate chapter for their discussion.

V

HEIGHT, WEIGHT, AND TEST SCORE

PHYSIQUE AND TEST SCORE

In the preceding chapters we have examined the characteristics of the distributions of height, weight and group-test score for the thirty-six-day-sample children. The average levels of physique and intelligence, when related to certain aspects of the family and social background, show a considerable amount of variation. The variations with family size, overcrowding and occupational class, are given in table XXXIV below. For ease of comparison, the averages have been expressed in standard deviation units.

The outstanding features of these relationships are perhaps more clearly seen in the diagrams than in the tables. For each of the three aspects of social background—family size, occupancy rate, and occupational class, the mean values for height, weight, and test score vary in much the same way. As size of

TABLE XXXIV

Means for Height, Weight and Test Score by Size of Family (in sigma units)

Size of Family	*n*	*Mean Height*	*n*	*Mean Weight*	*n*	*Mean Test Score*
1	780	+0·24	776	+0·24	756	+0·32
2	1529	+0·24	1521	+0·13	1529	+0·31
3	1441	+0·03	1443	+0·03	1437	+0·14
4	1118	−0·07	1113	−0·06	1095	−0·07
5	731	−0·17	729	−0·10	723	−0·26
6	483	−0·27	483	−0·18	469	−0·46
7	332	−0·31	325	−0·16	319	−0·44
8	223	−0·41	222	−0·24	216	−0·62
9 and over	284	−0·34	282	−0·25	266	−0·57
	6921		6894		6810	

TABLE XXXIV—*continued*

MEANS FOR HEIGHT, WEIGHT AND TEST SCORE BY OCCUPANCY RATE
(in sigma units)

Occupancy Rate	*n*	*Mean Height*	*n*	*Mean Weight*	*n*	*Mean Test Score*
1	585	+0·50	578	+0·42	569	+0·66
2	2871	+0·12	2859	+0·09	2843	+0·16
3	2149	−0·10	2142	−0·12	2111	−0·15
4	1307	−0·36	1306	−0·26	1259	−0·40
	6912		6885		6782	

MEANS FOR HEIGHT, WEIGHT AND TEST SCORE BY OCCUPATIONAL CLASS
(in sigma units)

Occupational Class	*n*	*Mean Height*	*n*	*Mean Weight*	*n*	*Mean Test Score*
1	229	+0·59	228	+0·44	221	+0·94
2	333	+0·24	332	+0·25	330	+0·37
3	244	+0·45	242	+0·32	236	+0·68
4	559	+0·25	557	+0·13	556	+0·43
5	2442	0·00	2437	−0·05	2392	+0·03
6	1224	−0·16	1222	−0·13	1190	−0·22
7	1191	−0·32	1191	−0·22	1132	−0·35
8	139	+0·23	136	+0·38	142	−0·03
9	442	+0·17	432	+0·32	428	−0·27
	6773		6777		6627	

	Height in Inches	*Weight in Pounds*	*Test Score*
Mean - - -	54·06	69·67	36·66
Standard Deviation	2·9	10·7	16·13

The same data are shown graphically in figures 21*a*, *b* and *c*.

family increases, for example, the average test score tends to become lower; similarly, both average height and weight also tend to decrease with increasing family size. A parallel correspondence between height, weight and test score obtains for occupancy rate and occupational class.

As is shown in table XXXV, the correlation between physique and test score is low; a pupil who obtains a high score on the test is not accordingly either very tall or very heavy. The

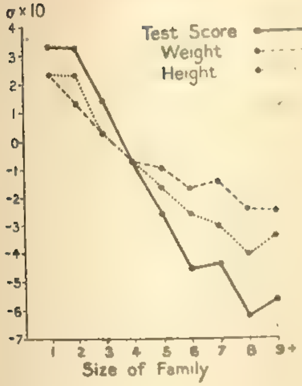

FIGURE 21*a* Mean Height, Weight and Test Score by Size of Family (in sigma units)

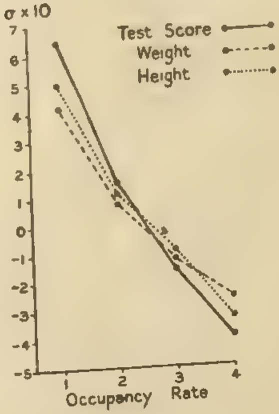

FIGURE 21*b* Mean Height, Weight and Test Score by Occupancy Rate (in sigma units)

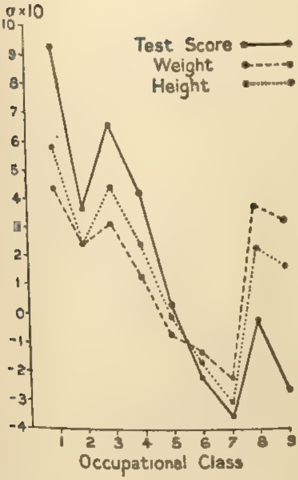

FIGURE 21*c* Mean Height, Weight and Test Score by Occupational Class (in sigma units)

TABLE XXXV

CORRELATION COEFFICIENTS: HEIGHT, WEIGHT AND TEST SCORE
(age partialled out)

	Boys	*Girls*
Height with Test Score	+0·24	+0·26
Weight with Test Score	+0·16	+0·22
Height with Weight	+0·68	+0·67

similarity of the variations of physique and test score in relation to social conditions is thus unlikely to be a reflection of an intrinsic correspondence between these variables. It is more likely that physique and test score each tend to vary with environmental conditions, but nearly independently of each other.

Another feature of the data in table XXXIV is that the pattern of variation for height, weight and test score is very similar for each of the social conditions we are examining. For all three conditions—family size, occupancy rate and occupational class, the variation of mean weight is less than that of mean height, which in turn is less than that of mean test score. If we assume, as we can do without serious error, that the relationships between family size and height, weight, and test score are rectilinear, and express the resulting regression coefficients in standard deviation units, we obtain, as the regression coefficients on family size, for weight—0·06, for height—0·09, and for test score—0·13. The rate of decrease of test score for increasing family size is thus about twice that for weight. The pattern of the variations of mean height, weight and test score for occupational class and occupancy rate is very similar; in each the amount of variation is greatest for test score and least for weight. Whether this is the result of the more intelligent parents being more able to create favourable environmental conditions for their children than parents of above average physique are able to do, or whether improvement in environment is more readily reflected in increased test score than in improved physique, is not revealed by our data. But the general conclusion is not affected. It seems established that, for our group of eleven-year-olds, height, weight and test score vary within each environmental condition in a very similar

way, and that the degree of variation is somewhat greater for test score than for either height or weight.

This close resemblance between the measures of physique and intelligence suggests several lines of investigation. In *The Trend of Scottish Intelligence* it was noted that the average test score of Scottish eleven-year-old children was about 2·3 points higher in 1947 than in 1932. This rise in average test score has been attributed, in part at least, to the 1947 children's greater familiarity with intelligence tests, though the effects of such familiarity remain to be seen. Yet it appears that corresponding to this increase in test score there is a general increase in average height and weight, where the question of familiarity with the measuring instrument does not arise. None of us, by taking thought, can add a cubit to our stature, though we may possibly add a few points to our IQ.

CHANGES IN PHYSIQUE OF SCOTTISH CHILDREN

More records for height and weight are available than for test score, though nearly all the physical measurements are for nine and thirteen-year-old children. The Education Health Service of Glasgow in the annual report for 1948[1] affords evidence for increases in average height and weight for nine-year-old and thirteen-year-old children between 1932 and 1948. This period is virtually the same as that which separates the 1932 and 1947 Scottish mental surveys. Over this period the average height of nine-year-olds had increased by about 1·3 inches, and of thirteen-year-olds by about 1·7 inches. The average weight of nine-year-olds increased by about 3·7 pounds, and that of thirteen-year-olds by about 6·8 pounds. Interpolating, we obtain an estimate of the increase for eleven-year-olds of about one and a half inches in height and about five pounds in weight. For the 1947 survey children the standard deviation of height is just under three inches. The increase in average height of Glasgow children between 1932 and 1948 is about one and a half inches. The standard deviation of weight is about ten pounds. The increase for Glasgow children between 1932 and 1948 is about five pounds. The standard devia-

[1] Report on the Medical Inspection and Treatment of School Children for the year ended July 1948, Glasgow Corporation Committee on Health

tion of test score is about fifteen points. The increase in average test score for Glasgow children between 1932 and 1947 is about one and a half points. For Glasgow children, the increase in height and weight is relatively much greater than the increase in test score.

This increase in physical dimensions does not appear to be confined either to Glasgow or to the period 1932 to 1948. Glasgow Corporation Education Health Service in its report for 1945 has published records which show a consistent increase of the heights and weights of school children from 1910. During this period of thirty-five years the average height of thirteen-year-olds has increased by over three inches, and their average weight by about twelve pounds. For the same period the Aberdeen City children of the same age show an almost identical increase in both height and weight. There can be little doubt but that the eleven-year-olds would show a corresponding, if slightly smaller, increase. From 1938 to 1948, however, records for most of Scotland are available.[1] During most of this decade the country was at war, with the consequent disturbance of social services and food supplies. Nevertheless, the average height of nine-year-olds increased by about one-third of an inch, and that of thirteen-year-olds by about half an inch. Average weight increased by about one and a half pounds for nine-year-olds, and by about two and a half pounds for thirteen-year-olds. The general rate of increase seems to be greater in the cities than in the counties, so that the figures given for Glasgow for the period 1932-48 are probably an over-estimate for the whole of Scotland. Though, for the period 1932-48, the average height and weight of Glasgow children has apparently increased more than the average height and weight of children in the rest of Scotland, and the average group-test score has increased less than in the rest of the country, it appears likely that there has been for Scottish children as a whole a comparatively greater increase in physique than in test score. If we attempt what can only be a very rough estimate of the increases in height, weight and test score for

[1] Thanks are again due to Dr J A G Keddie of the Department of Health for Scotland for his assistance in obtaining the data on which the above considerations are based.

eleven-year-old Scottish children between 1932 and 1947, we find that, in terms of the standard deviations of the 1947 survey measures, the increases in height, weight, and test score are respectively of the order of 0·25 sigma, 0·3 sigma and 0·15 sigma.[1]

CHANGES IN PHYSIQUE AND IN TEST SCORE

It has already been noted that test score varies to a greater degree with differences in social environment than do height and weight. If the increase in the average height and weight of children over the past few years is attributed, as it generally is, to improved environmental conditions, we are faced with the problem of explaining why intelligence test score has not increased to a similar degree.

It may be that the environmental influences, especially improved nutrition and health services, which are conducive to better physique, are not necessarily conducive to improved intelligence; the aspects of the social environment which we have selected for investigation are those most closely associated with intellectual development, while other aspects not included in this survey may be more closely associated with physical development. Though it does appear that intelligence and physique are not closely related, it is not so easy to believe that the changes in environmental conditions which are accompanied by an increase in height and weight over a period of years should not be accompanied to some extent by a corresponding improvement in intellectual capacity. Nevertheless our results show only a comparatively small increase in average group-test score, and no significant increase in Binet IQ.

It seems likely, therefore, that the greater variation of test score between different social conditions must be mainly due to the children in the various social conditions having been selected to a considerable extent by paternal intelligence, so that these differences in average test score exaggerate the influence of social environment on intelligence as measured by the

[1] The standard deviations of height and weight are not strictly comparable with the standard deviation of score on a group intelligence test, where the number of items sets a limit to the pupils' possible score. The figures given above are, however, only a very rough estimate; in a more precise estimate this particular difficulty would begin to assume significance.

group test. The degree of selection by parental height and weight is not likely to be nearly so great. Any attempt to deduce the extent to which the increase in test score between 1932 and 1947 is due to betterment of social conditions during that period leads to immediate difficulties and apparent contradictions. The environmental influence must, judging from the data examined, be such as would result in a distinct increase in height and weight, a smaller increase in group-test score, and to on clear increase in individual test score. Until more is known about the interaction between test score, height, weight, and the various aspects of the social environment, no definite conclusions are possible.

HEIGHT AND FAMILY SIZE

We have so far discussed the relationship between physique and test score on the assumption that the increase in average height and weight over the past few years has been mainly the result of improved social and physical conditions of living. Let us now consider the consequences of assuming that this increase is mainly due to a genetic change in the constitution of the population, influenced necessarily by concurrent environmental changes. What evidence there is, indicates that during the present century there has been a distinct increase in the average height and weight of the child population. A negative correlation between the size of family and height and weight respectively has also persisted during this period. The evidence for this negative correlation is admittedly incomplete, but it is very unlikely that the relationship between family size and physique is specific to children born in 1936, and does not obtain for children born for some years before that date. Corroboration is obtained from Canadian data, where the same negative correlation was observed in Toronto children.[1] Subsequent measurements of Toronto children thirteen and twenty-nine years later showed a marked increase in height, despite this negative correlation.[2]

[1] *Changes of Bodily Form of Descendants of Immigrants*, Washington Commission, 61st Congress (Document 208). Washington, USA: Government Printing Office, 1910

[2] *A Height and Weight Survey of Toronto Elementary School Children*, 1939. Ottawa: Minister of Trade and Commerce, 1942

There appears to be no evidence available which would give any reason for the belief that a negative correlation between family size and height is necessarily accompanied by a lowering of the average stature of children. What evidence there is points to the contrary. There likewise appears no reason to believe that the same relationship between family size and height leads to a reduction in the average height of the adult population.

Dr G M Morant of an Air Ministry research unit, who is one of the major authorities in this field, has kindly given permission for his conclusions to be quoted. These refer to adult stature, and there is, he states, good reason to believe that they are reliable as far as the British population is concerned.

'(I) When any community at a particular time is fairly represented, the age curve for height—that is the curve given by average heights at different ages—shows a rise to a maximum somewhere between eighteen and thirty years of age, followed immediately by a gradual decline. The decline following the attainment of skeletal maturity can be attributed to a normal shrinkage of the length of the body with advancing age, probably due principally to changes in the intervertebral discs. The alternative hypothesis explaining the decline as due to a secular change in the population, older men being shorter because they were born earlier, is not acceptable in view of all the evidence. The hypothesis that the decline may be due to a selective death rate, taller men being prone to die at younger ages, is also unacceptable.

'(II) At any particular time the age (or more properly the distribution of ages) at which maximum height is reached, makes clear distinctions between different social classes, being earlier for the more favoured and later for the less favoured communities. When there is selection within a class, the group which is physically fitter—such as men accepted for the fighting forces compared with those rejected—matures at a younger age.

'(III) Considering the best estimates that can be given for the general population, there is good evidence for British males that the age at which maximum height was normally reached became progressively younger from about 1870. The age was

about twenty-seven years in 1870, and it is about nineteen years today. The secular trend was very slow until 1900; it became more marked in the present century, and was apparently accelerated during the past ten years. The tendency for skeletal maturity to be reached at a progressively earlier age was shown by all classes of the community, but in terms of years of age it was greatest for the lower classes.

'(IV) Considering again the best estimates that can be given for the general population, the maximum of the British age curve for height is 1,715 mm and this has remained unchanged in the past hundred years. There are clear distinctions between the levels of the curves for different classes of the community, and those also appear to have remained practically unchanged.

'Considered together, these general conclusions seem to supply all the evidence needed to give an answer to the question whether we are taller than our ancestors or not. The answer, of course, is different for different ages of life. There was a clear secular change in the growth rate but not in the maximum height reached at maturity, i e, the maximum of the age curve. For the period since 1870, it may be inferred that averages were increasing from year to year for adolescent ages. For the early twenties the same would have been found for years up to about 1940, but not after that date, because skeletal maturity is now normally reached at some age younger than twenty years.'

The relevance of these findings to our data is clear. If boys are reaching the average mature stature of 67·6 inches (1,715 mm) at an increasingly earlier age, then their rate of growth must be faster. Thus, for constant age, the measurements of heights taken at intervals over a period of years should show consecutive increases in the average values. This is what has in fact been observed, and the increases appear to be of about the same order of magnitude as those required by Dr Morant's conclusions, though it must be remembered that the rate of increase in stature is not uniform for all ages, and that there may be complicating factors which we are unable to assess.

A fairly clear pattern in the development of stature in the population has become evident. Over the last half century or so the average height of children of any given age appears to have been increasing. This has not been accompanied by a

corresponding increase in the average height of the adult population, but by a tendency for maximum mature height to be reached at increasingly early ages. This tendency is not uniform for the whole population, but shows variations according to social conditions. The probability also is that these trends have throughout been accompanied by a negative correlation between height and family size. Though most of the evidence refers to male stature, it is not unreasonable to assume that the inferences will apply equally to female stature, and probably to weight as well.

THE TREND OF INTELLIGENCE IN THE POPULATION

Let us consider now whether the data on intelligence test scores are consistent with a similar pattern of the trend of intelligence in the population. The negative correspondence between intelligence and family size appears to be of fairly long standing. The Report of the Royal Commission on Population[1] gives figures for family size in different social classes. For parents married in 1851-61 the average size of family for the professional class was eighty-six per cent of the average for the population as a whole; for professional-class parents married in 1881-6 this figure had decreased to seventy-two per cent. For the same two periods the average size of family of unskilled workers rose from one hundred and five per cent to one hundred and twelve per cent of the average of the whole population.[2] Our survey figures, though not exactly comparable, are sixty-two per cent for the professional classes and one hundred and eighteen per cent for the unskilled manual workers. Since the introduction of intelligence testing in the early years of this century, it has been noted on more than one occasion that children of parents of professional status are more intelligent, in terms of average test score, than children whose fathers are unskilled or casual workers. The negative correlation between family size and intelligence has also been established

[1] Cmd 7695. HMSO, June 1949

[2] More recent analysis of data collected for the Royal Commission on Population shows that, within the 'middle' classes, the average fertility of the professional and employer group is somewhat lower than that of the salaried employees. Also, the average fertility of those who move up or down the socio-economic scale appears to be intermediate between that of the class from which they came and that of the class into which they have moved.

independently by a number of investigators prior to the present survey.

The survey results, which show a variation in average test score with social conditions, and a negative correlation between family size and test score, appear therefore to reflect a fairly well-established general trend in the community. The correspondence between test score and height, in relation both to social conditions and family size has already been noted, and what evidence there is would lead to the conclusion that our data for height also represent a general trend of the same kind.

By analogy with the evidence for stature we should expect to find, over a period of years, an increase in the average intelligence of children tested at the same age. Records of yearly averages for test score are not available to anything like the same extent as for height and weight. And what evidence exists is conflicting. Burt, testing after an interval of nineteen years, claimed to have observed a fall of 1·3 points of IQ in London children. Cattell, testing after an interval of thirteen years, found an increase of 1·3 points of IQ for children in Devonshire and Leicester. The Scottish mental survey results show, after an interval of fifteen years, a rise of 2·3 points of group-test score, and for the sample of children individually tested, no clear increase or decrease in IQ. The balance of the evidence is rather against a fall, and slightly in favour of a rise. An intelligence test, group or individual, is by no means an exact measuring instrument, and it is not at all certain what exactly it measures. Probably only a gross change in the intellectual level of the child population would be clearly shown in test scores. It is generally agreed that intelligence test scores are a resultant of natural ability and environmental opportunity. It is possible, therefore, that a decline in the average level of intelligence is being obscured by the effects of environmental conditions on test score. It is equally possible that a rise in average intelligence is being obscured by environmental effects. If we assume that our analogy with stature is sound, the latter hypothesis is more acceptable, though it does not necessarily follow that any rise in average intelligence is taking place at the same rate as the corresponding rise in average height.

Morant's conclusion that the average mature stature of the

male population, while remaining constant in magnitude, is being attained at progressively earlier ages is based on the study of extensive records of adult stature. No such records exist for intelligence test scores, though, if the practice of administering intelligence tests to recruits for the armed forces continues, it is possible that in the future information on this point will be obtained.

Nearly all predictions of a decline in national intelligence are inferences from the apparent increase in the incidence of mental defect or from the negative correspondence between intelligence test score and family size. The first line of inference is suspect in view of the varying standards of ascertainment and different connotation of mental defect in the investigations. The second line of inference would lead to the prediction of a similar decline in national stature. This, as we have seen, is contrary to the evidence. There is no good reason, therefore, to infer from a negative correlation between test score and family size that the average intelligence of the population is declining. It is possible that, as with stature, the average level of adult intelligence remains more or less constant, and may be reached at an increasingly early age.

Wherein lies the fallacy in deducing a decline in intelligence from the negative correspondence with family size? It may be that the negative correspondence is the result of environmental differences between children in large and small families, the latter having the advantage. But the analysis of the 1947 mental survey data does not support this explanation, at least for such aspects of environmental conditions as were recorded. Within each environmental category the negative correlation between family size and test score persists. Another possible explanation of the apparent paradox is offered by Professor Penrose.[1] He demonstrates that it is genetically possible for both a stable level of intelligence and a negative correlation between family size and intelligence to occur together in the same population, and he constructs a model of one such population which satisfies both conditions. Professor Penrose's discussion is an inter-

[1] L S Penrose, 'Genetic Influences on The Intelligence Level of the Population,' *British Journal of Psychology*, General Section, vol XL, pt 3, March, 1950

esting and ingenious one, and whether or not his hypotheses meet with general acceptance, the problem is one which requires further elucidation.

We are nevertheless still in the realms of hypothesis and speculation, and in the last resort the trend of national intelligence can only be ascertained by a series of direct measurements over a long period of years. The two Scottish surveys are but the first step. These surveys have the advantage of being virtually free from sampling errors; other parallel investigations, for example, that of Professor Cattell,[1] are open to criticism on this point, though Professor Cattell's advocacy of a 'culture-free' test must meet with general agreement.

It is not practicable at present to make any sure estimate of the trend of intelligence in the population. Our investigations have given us no reason to predict a fall in the average level of intelligence; there is indeed some reason for believing that the average level of adult intelligence is remaining constant, though the rate of intellectual growth in children may be increasing. But only time and further investigations will tell.

[1] R B Cattell, *Eugenics Review*, vol XLII, No 3, 1950

VI

HIGH AND LOW SCORERS

A HIGH SCORER is defined as a pupil who scores fifty marks or more in the group test, the maximum being seventy-six. No allowance was made for differences of age within the year. A low scorer is a pupil who scores nineteen marks or fewer in the test. The low scorers include the group of children marked YY, that is, those who were unable to attempt the test owing to physical or mental defect. Of the 70,805 children who took the survey test, 16,213, or 22·9 per cent, are high scorers, and 11,680, or 16·5 per cent, are low scorers. It did not prove feasible to make the numbers in the two groups equal, and as the distribution of test score is neither normal nor symmetrical, selection in terms of standard deviation would have made little improvement in this respect. A score of fifty in the test is 0·83 standard deviation units above the mean and a score of twenty is 1·04 standard deviation units below the mean.

SEX

Of all the pupils who did the test, 50·6 per cent were boys. In the high scorers the number of boys and girls is virtually the same, though, as the score becomes higher the proportion of boys increases, 55·2 per cent of those scoring seventy or over being boys. Boys constitute the majority of the low scorers, 58·0 per cent of this group being boys. Again, in the lowest

TABLE XXXVI

MEAN TEST SCORE

	High Scorers		*Low Scorers*		*All Survey*	
	n	*Score*	*n*	*Score*	*n*	*Score*
Boys	8087	56·71	6773	9·82	35809	35·81
Girls	8126	56·55	4907	10·80	34996	37·59
Both	16213	56·63	11680	10·23	70805	36·69

scoring group, 0-9, there is a still greater preponderance of boys; they constitute 62·7 per cent of this particular group. The boys, therefore, tend to be more frequent than the girls at both extremes of the range of test score, this being but a further reflection of the frequently observed fact that the spread of intelligence test scores is greater for boys than for girls.

TABLE XXXVII

HIGH AND LOW SCORERS—DISTRIBUTION OF AGE AT DATE OF TEST

	High Scorers				*Low Scorers*			
Age in Months	*Boys*	*Girls*	*Both*	*Both as Percentage of* 16213	*Boys*	*Girls*	*Both*	*Both as Percentage of* 11680
136½	899	889	1788	11·0	433	307	740	6·3
135½	821	848	1669	10·3	440	352	692	5·9
134½	928	899	1827	11·3	466	363	829	7·1
133½	879	857	1736	10·7	507	375	882	7·6
132½	575	779	1536	9·5	568	395	963	8·2
131½	693	719	1412	8·7	569	444	1013	8·7
130½	626	655	1281	7·9	550	445	995	8·5
129½	577	607	1184	7·3	598	388	986	8·4
128½	548	505	1053	6·5	592	423	1015	8·7
127½	511	486	997	6·1	623	490	1113	9·5
126½	466	467	933	5·8	686	510	1196	10·2
125½	382	415	797	4·9	741	515	1256	10·8
	8087	8126	16213	100·0	6773	4907	11680	99·9
Mean Age in Months	131·87	131·85	131·86		130·47	130·42	130·45	

In the whole survey population the difference in points of test score between the two sexes is 1·78, and this is in favour of the girls. In the group of low scorers the girls remain slightly superior, their average score being 0·98 points higher than that of the boys. In the high scorers, the position is reversed, the boys' mean score being 0·16 points higher than that of the girls. The sex difference in test score does not seem to be present equally at all levels of intelligence; among the very intelligent pupils there is not only a slightly greater proportion of boys, but the average score of these boys is a little superior to that of the

girls. In the low scorers, the boys are not only more frequent but also inferior in score to the girls in the same group.

AGE

It has already been shown (chapter I) that the average test score of the pupils increases with age at the rate of 0·67 points of score per month, or approximately eight points of score per year. It would be expected, then, that the high scorers would tend to be older than the low scorers, though it is obvious that age alone cannot be responsible for the difference. The distributions of the high and low scorers by age are given in table XXXVII.

The difference in the average ages of the high and low scorers is 1·41 months, which represents a difference of less than one point of score as the result of age difference alone. It is also clear that the proportion of high scorers diminishes steadily from the older children to the younger, while the reverse happens with the low scorers. The difference in the constitution of the two groups in respect of average age is nevertheless comparatively small.

SIZE OF FAMILY

Family size is another variable which is related to test score. For all the survey children a clear diminution of average test score occurs as family size becomes larger.[1] For the high and low scorers the results are set out in appendix table 29 and presented graphically in figure 22.

From examination of the data for high and low scorers alone we should infer that there is little, if any, relationship between intelligence test score and family size. The results are analogous to what would be obtained from the testing of a selected group, such as university students. A small negative correlation between intelligence test score and family size was found for a group of students attending the London School of Economics.[2] A somewhat similar group of students attending Moray House Training College showed a very small and not statistically signi-

[1] *The Trend of Scottish Intelligence*, ch VII
[2] *Eugenics Review*, vol XL, July 1948, pp 77-84, and vol XLII, December 1950, p 209

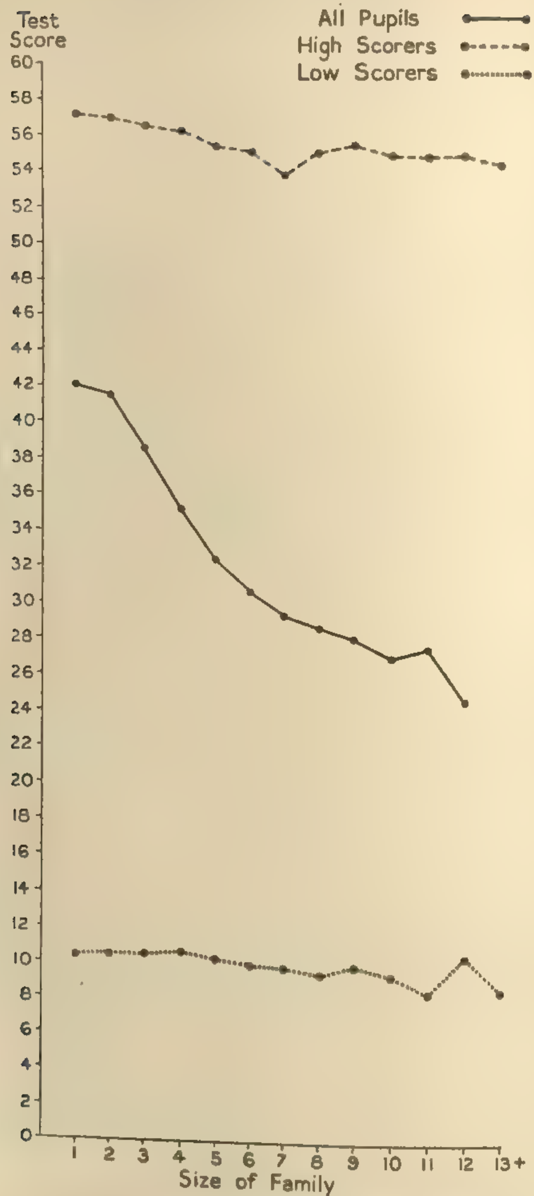

FIGURE 22 Mean Test Score by Size of Family

ficant correlation between test score and family size. These findings are very similar to what we observe in the high scorers. In the survey data, however, we have also the population from which the high scorers were drawn, an advantage which was lacking in the investigations on such selected groups as students. It is thus possible to ascertain what proportion of each family size is high scorers, and what proportion low scorers. The results are shown in figure 23.

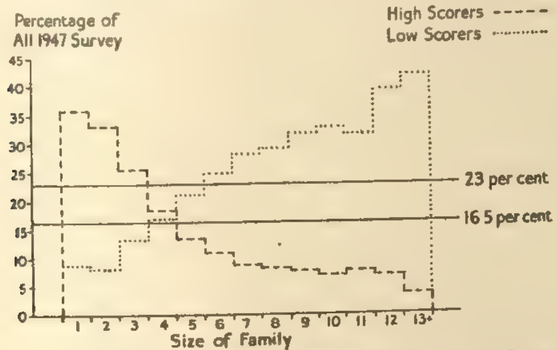

FIGURE 23 High and Low Scorers as Percentages of All 1947 Survey by Size of Family

The 23 per cent of the survey population who are high scorers contain 35·5 per cent of the children from families of one child, 33·6 per cent of the families of two, and so on in decreasing proportion till we find only 3·2 per cent of the families of more than twelve children appearing in the high-scoring group. Conversely, the 16·5 per cent of the survey population who are low scorers contain 42·7 per cent of the children from families of more than twelve, but only 9·8 per cent of the children from families of one. It is clear that, despite the exiguous relationship between test score and family size found within both the high and low scoring groups, the high scorers are very largely drawn from small families and the low scorers mainly from the larger families. While it is possible that inferences about the relationship between family size and intelligence, drawn from the study of groups selected by intelligence, may be misleading, the negative correlation between family size and intelligence for the whole survey population, as expressed in figure 22, remains unequivocal.

OCCUPATIONAL CLASS

The preceding discussion of sex, age and family size has been based on the results obtained from the complete survey group of over 70,000 children. Information about the remaining topics is

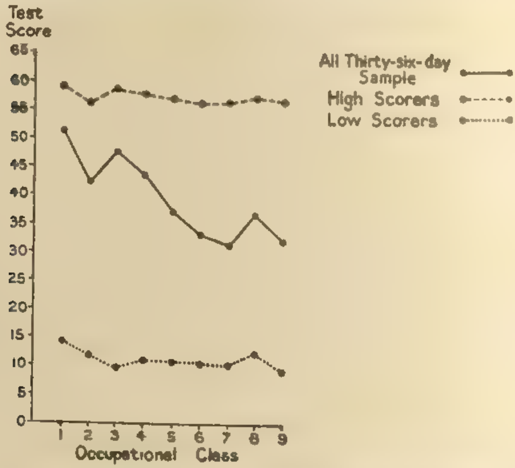

FIGURE 24 Mean Test Score by Occupational Class

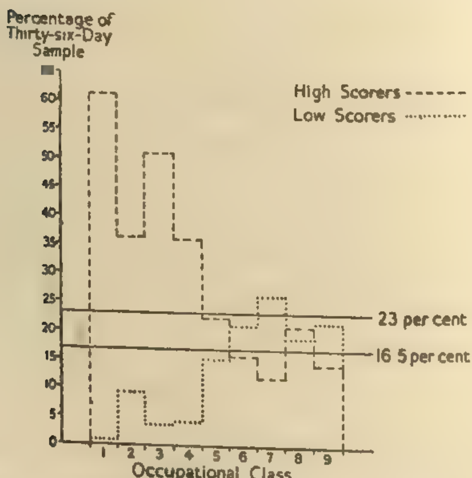

FIGURE 25 High and Low Scorers as Percentages of Thirty-six-day Sample by Occupational Class

available only for the children in the thirty-six-day sample, but the data discussed in chapter I show there is a very close correspondence between the thirty-six-day sample and the

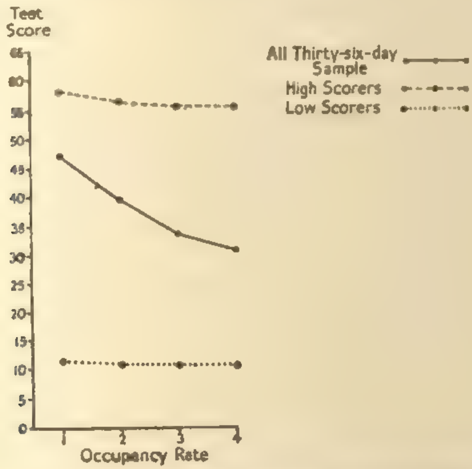

FIGURE 26 Mean Test Score by Occupancy Rate

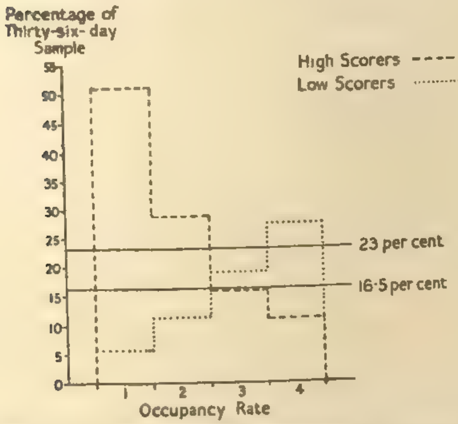

FIGURE 27 High and Low Scorers as Percentages of Thirty-six-day Sample by Occupancy Rate

whole survey group for those items which were recorded for both. In the thirty-six-day sample 23·0 per cent of the children are high scorers and 16·4 per cent are low scorers, as compared

with the 22·9 per cent and 16·5 per cent respectively for the whole survey.

The pattern presented by occupational class and occupancy rate is very similar to that for family size (see appendix tables 30 and 31). As is shown in figures 24 and 26, there is a definite correspondence between intelligence test score on the one hand and occupational class and occupancy rate on the other. Within the high and low scoring groups this correspondence tends to vanish. Again, within a group selected for intelligence, the relationship between intelligence and social background is obscured. But if we regard only the proportion of children drawn from each social class or type of home, we find a very distinct relationship between intelligence test score and social conditions. Figures 25 and 27 give the same type of curve as figure 23, in which the upper and lower halves appear almost as mirror images of each other. Whatever trends prevail for the high scorers, the reverse tend to prevail for the low scorers; for instance, the class which contains the largest proportion of high scorers is that which also, not unexpectedly, has the smallest proportion of low scorers in it.

Distinct differences occur between the high and low scorers in respect of the occupational classes from which they are drawn. Over seventy per cent of the children whose fathers are professional men are high scorers; none are low scorers. Over a quarter of the children of unskilled manual workers are low scorers; about twelve per cent are high scorers. Much the same holds for the occupancy rate of the home. Just over half of the children in the homes with fewest persons per room are high scorers; about five per cent are low scorers.

OCCUPANCY RATE

The high scorers as a group tend to have fathers who are presumably more intelligent and who are probably in better economic circumstances than those of the low scorers. But this is by no means a universal rule. Referring to table XXXVIII we find that 9·3 per cent of the high scorers come from the most overcrowded homes, and 8·7 per cent are children of unskilled manual workers. In fact, there are more high scorers from the homes of the unskilled manual workers than from the

homes where the father is professionally qualified, one hundred and thirty four as against one hundred and two.[1] The figures in table XXXVIII also give the impression that the distinction by occupancy rate and occupational class is less marked for the high scorers than for the low scorers. Though the high scorers, being more numerous, are biased a little more towards the average, yet the high scorers appear to be more evenly distributed among the different social groups and types of home than the low scorers. It would appear as if unfavourable circumstances did not militate too severely against high scorers, while favourable circumstances tend to ensure at least an 'average' level of score.

TABLE XXXVIII

HIGH AND LOW SCORERS AND ALL THIRTY-SIX-DAY SAMPLE —DISTRIBUTION OF (*a*) OCCUPATIONAL CLASS, (*b*) OCCUPANCY RATE

(*a*) *Occupational Class*

High Scorers	1	2	3	4	5	6	7	8	9	*Total*
n	141	125	119	202	549	184	134	30	62	1546
Percentage	9·1	8·1	7·7	13·1	35·5	11·9	8·7	1·9	4·0	100·0
Low Scorers										
n	2	29	9	26	368	252	296	26	96	1104
Percentage	0·2	2·6	0·8	2·4	33·3	22·8	26·8	2·4	8·7	100·0
All Thirty-six-day Sample										
n	221	335	236	558	2404	1199	1141	143	433	6670
Percentage	3·3	5·0	3·6	8·4	36·0	18·0	17·1	2·1	6·5	100·0

(*b*) *Occupancy Rate*

High Scorers	1	2	3	4	*Total*
n	284	801	333	146	1564
Percentage	18·2	51·2	21·3	9·3	100·0
Low Scorers					
n	31	344	398	350	1123
Percentage	2·8	30·6	35·4	31·2	100·0
All Thirty-six-day Sample					
n	569	2844	2111	1259	6783
Percentage	8·4	41·9	31·1	18·6	100·0

[1] The fathers of the remaining thirty-nine children in occupational class 1 are employers.

AGE OF MOTHER

Earlier in this volume (chapter III) the inadvisability of basing any general conclusions on differences of maternal age has been discussed. The children of the younger and the older mothers are to a considerable extent selected by size of family and occupational class. Figure 28 illustrates the proportions of high and low scorers for each age group of mothers (see appendix table 32).

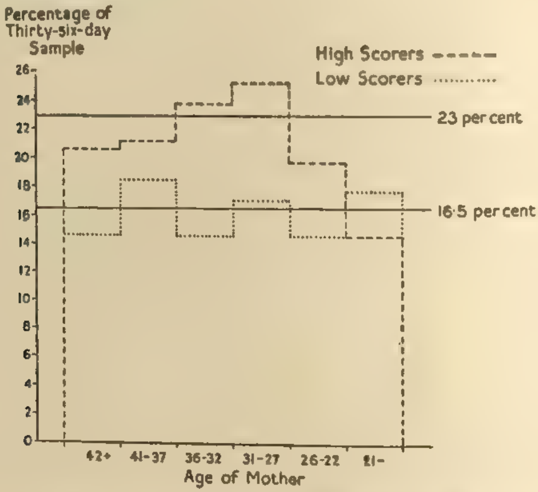

FIGURE 28 High and Low Scorers as Percentages of Thirty-six-day Sample by Age of Mother

Data involving maternal age are always rather difficult to interpret, but figure 28 suggests that, up to the age of thirty-one, the proportion of high scorers increases with maternal age, and the proportion of low scorers decreases. With mothers over thirty-one, the difference between the proportion of high and low scorers tends to diminish. It is doubtful even if we can infer that twenty-seven to thirty-one years is the optimum age for bearing intelligent children; it is more probable that women at that age are most likely to have intelligent children as a result of the social and economic circumstances in which they live. But the fact remains that the children of the youngest mothers contain a low proportion of high scorers and a high

proportion of low scorers. With the mothers of the middle age groups the position is reversed, while with the older mothers, the proportion of high and low scorers is approximately the same.

HEIGHT AND WEIGHT

As there is a small but positive correlation between height and test score, and between weight and test score (see chapter V), we should expect that the high scorers' physique, as revealed by these measurements, would be slightly superior to that of the low scorers. From the distributions given in appendix tables 33 and 34 we obtain the results set out in table XXXIX below.

TABLE XXXIX

MEANS AND VARIANCES FOR HEIGHT AND WEIGHT
(uncorrected for age)

	Height in Inches			*Weight in Pounds*		
	n	*Mean*	*Variance*	*n*	*Mean*	*Variance*
			High Scorers			
Boys	719	55·30	7·44	718	73·11	109·12
Girls	770	55·06	8·68	769	72·48	146·30
Both	1489	55·17	8·09	1487	72·78	128·45
			Low Scorers			
Boys	601	53·13	8·25	603	67·90	98·25
Girls	481	52·61	8·75	475	64·73	100·46
Both	1082	52·90	8·47	1078	66·50	101·69
			Thirty-six-day Sample			
Boys	3428	54·17	8·15	3426	70·34	100·95
Girls	3543	53·96	8·97	3518	69·00	128·46

For the thirty-six-day sample of pupils boys are taller and heavier than girls; within the high-scoring group the difference between the sexes is of much the same order as it is for the whole sample. In the low scorers, however, the boys are more clearly superior in both height and weight. This is probably connected with the differential growth rate for boys and girls which has been discussed in chapter II. Significant differences in height and weight between the high and low scorers occur. The high scorers are 2·27 inches taller on the average than the low scorers, and 6·28 pounds heavier. These are quite sub-

stantial differences, and the difference between the ages of the two groups is not a sufficient explanation. The fact that the high scorers are both taller and heavier than the low scorers should help to dispose of the still-common belief that lack of brain tends to be compensated for by increased brawn, and that intelligent children tend to be physically below average. The results in table XXXIX and in figures 29*a*, 29*b*, 30*a*, 30*b* clearly indicate the contrary.

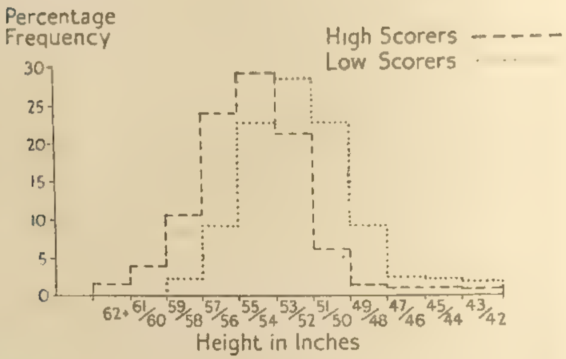

FIGURE 29*a* Percentage Distribution of Height for High and Low Scorers

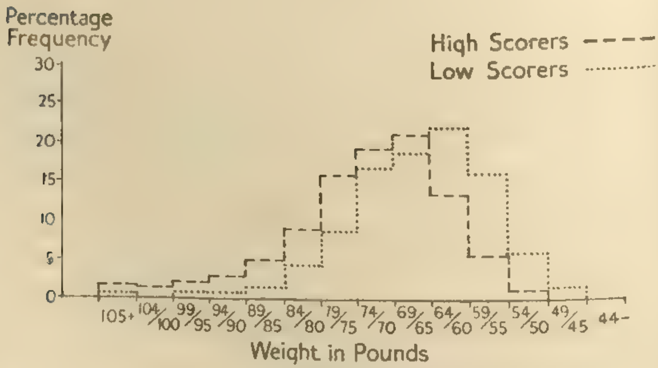

FIGURE 29*b* Percentage Distribution of Weight for High and Low Scorers

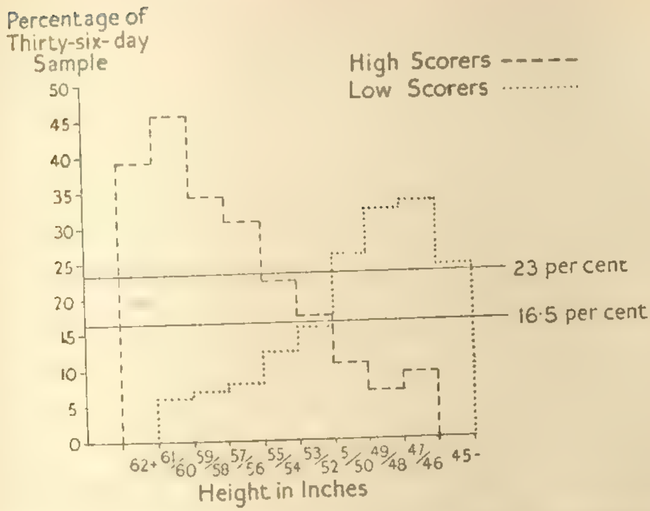

FIGURE 30*a* High and Low Scorers as Percentages of Thirty-six-day Sample by Height

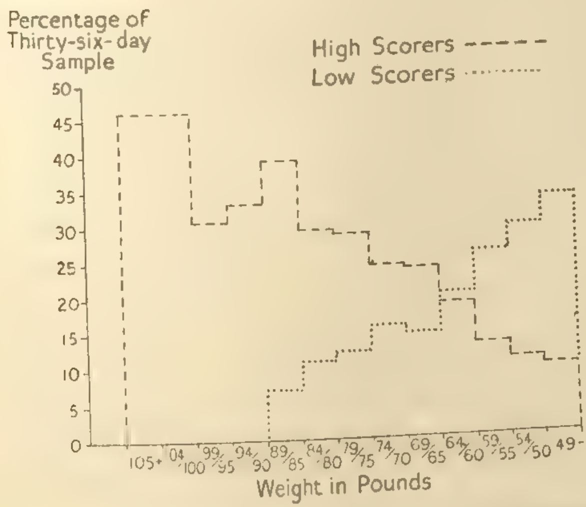

FIGURE 30*b* High and Low Scorers as Percentages of Thirty-six-day Sample by Weight

Note: Distributions are curtailed when the number of cases is too small.

CLASS IN SCHOOL

Though a full examination of the educational background of all the survey children is reserved for a later volume, we are able to discuss here briefly the data for the pupils of the thirty-six-day sample in connection with their class in school. The terminology of classification in use at the time of the survey has since been altered, but we shall adhere throughout to the older nomenclature.[1] The pupils have been divided first into four groups, infants, primary, secondary and special-school pupils. Within each group the pupils have been classified according to their level or class within the group. There are normally two infant classes, five primary classes, and five or six secondary classes. The pupil normally spends one school year in each of these classes. Thus, a pupil entering school at the age of five plus will spend the first year in infants I, the second in infants II, the third in primary I, and so on. In individual cases exceptions can be made, and are made, often in considerable numbers.

It is the common practice of Scottish education authorities to have two entrance dates for pupils, usually 1st April and 1st August. All children are obliged to begin their education at the first entrance date after their fifth birthday. Those of the survey pupils who were born in January, February and March 1936 would enter school on 1st April 1941, those born in April to July inclusive would enter on 1st August 1941, while the remainder would enter on 1st April 1942. It is also the practice in some schools, particularly the larger ones, for the pupils who enter in April to be transferred to a higher class the following April. In other schools, both the April and August entrants are

[1] By The Schools (Scotland) Code 1950, which came into operation on 1st August 1950, the numbering of classes in Scottish schools was altered

Age	*Pre*-1950	1950 +
5	Infant Junior	Class PI (Infant)
6	„ Senior	„ PII (Infant)
7	Primary I	„ PIII
8	„ II	„ PIV
9	„ III	„ PV
10	„ IV	„ PVI
11	„ V	„ PVII
12	Secondary I	„ SI
13	„ II	„ SII
	etc	etc

transferred to primary I at the same time, the April entrants thus having spent a longer time in the infant department.

TABLE XL

HIGH AND LOW SCORERS—DISTRIBUTION OF CLASS IN SCHOOL

Class in School	*High Scorers* *n*	*Percentage of* 1561	*Low Scorers* *n*	*Percentage of* 1017	*Thirty-six-day Sample* *n*	*Percentage of* 7156
Infants	0	0	5	0·5	8	0·1
PI	0	0	25	2·5	33	0·5
PII	0	0	163	16·0	233	3·3
PIII	61	3·9	465	45·7	1511	21·1
PIV	964	61·8	347	34·1	4228	59·1
PV	516	33·1	12	1·2	1112	15·5
Secondary	20	1·3	0	0	31	0·4
Total	1561	100·1	1017	100·0	7156	100·0
PX*	4		38		57	
Special Schools[1]	1		68		86	
Grand Total	1566		1123		7299	

Class in School	*High Scorers as Percentage of Thirty-six-day Sample for each Class in School*	*Low Scorers as Percentage of Thirty-six-day Sample for each Class in School*
Infants	0	62·5
PI	0	75·8
PII	0	70·0
PIII	4·0	30·8
PIV	22·8	8·2
PV	46·4	1·1
Secondary	64·5	0
All	21·8	14·2
PX*	7·0	66·7
Special Schools[1]	1·2	79·1
All	21·5	15·4

*PX means in primary school but class unknown

Assuming both practices to be equally common, we estimate that, of 7,200 children born in 1936, we should find, in round

[1] Special Schools include schools for physically handicapped children.

figures, that in June 1947 1,500 would be in primary III, 4,800 in primary IV, and 900 in primary V. References to table XL gives the observed figures as 1,511 for primary III, 4,228 for primary IV, and 1,112 for primary V. Allowing for the fact that the procedure varies from one education authority to another, and that the pupil's class is determined not only by age but by such other factors as ability and regularity of attendance, our rough estimate is not very far out.

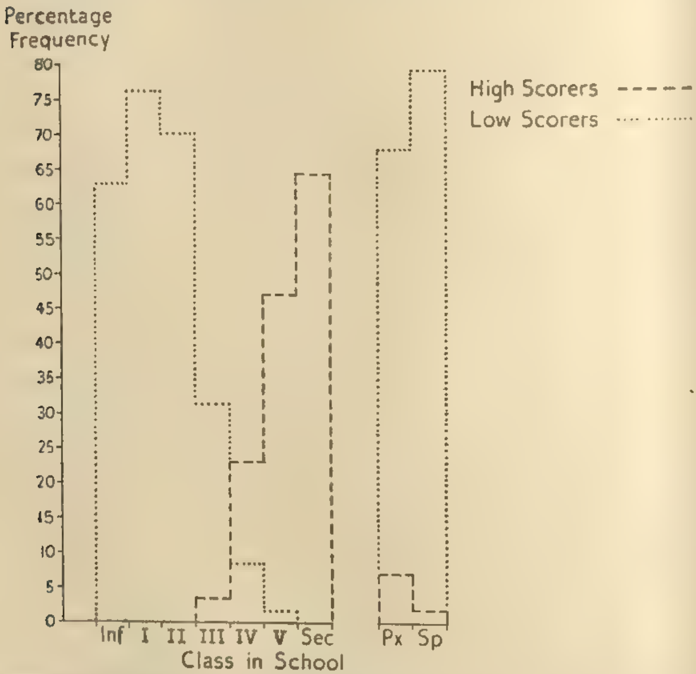

FIGURE 31 High and Low Scorers as Percentages of Thirty-six-day Sample by Class in School

Note: Inf = infant department; I-V = primary I-V; Sec = Secondary; PX = primary, class unknown; Sp = special school

There is quite a considerable range of classes containing all the thirty-six-day-sample pupils, but the great majority are to be found in primary III, IV and V. Nearly sixty per cent are in primary IV. In the high-scoring group about sixty per cent

are also in primary IV, but there are comparatively few below that level. About a third of the high scorers are in primary V, and a very small proportion have reached the secondary school. The proportion of high scorers in the upper classes is greater than can be attributed to their greater age alone. The impression gained from table XL is that the more able pupils tend to progress through the school at more or less the regulation pace, and if there are only a very few retarded high scorers, there are also comparatively few who have advanced beyond the class in which their age would normally have placed them. With the low scorers, on the other hand, there has been a greater degree of retardation than there is advancement of the high scorers. Only about a third are in primary IV, nearly half are in primary III, and a considerable proportion is in primary II among the eight and nine-year-olds; there is even a 'tail' of low scorers below that. The educational progress of the pupils with ability and aptitude appears to be to a considerable degree limited by their age, whereas the progress of the duller children of the same age appears to be governed mainly by their lack of ability and aptitude. It may be argued that both sets of pupils are being retarded, the more intelligent pupils by school organisation, and the less intelligent pupils by their ability, or rather lack of ability.[1]

PREVIOUS TEST EXPERIENCE

These differences in class within the school may throw some light on the influence of previous test experience. Of the low scorers, 6·8 per cent had been previously tested during the current school year by a test similar to that used in the survey; 25·9 per cent of the high scorers had been similarly tested. This difference appears to be mainly a function of the class in school, as the proportion of all children previously tested increases in the higher classes. For example, 7·0 per cent of pupils in primary III, 16·1 per cent of pupils in primary IV, and 33·5 per cent of pupils in primary V have had previous test experience. Extracting the high and low scorers from these classes we find that in primary III 5·8 per cent of low scorers and 4·9 per cent

[1] cf *Scottish Primary School Organisation.* Publications of the Scottish Council for Research in Education, XIV, pp 19-25

TABLE XLI

(*a*) MEAN TEST SCORE BY CLASS IN SCHOOL FOR THIRTY-SIX-DAY SAMPLE
(Pupils Previously Tested and Not)

Class in School	*Previously Tested*		*Not Previously Tested*		*Total*		*Previously Tested as Percentage of Total*
	n	*Mean*	*n*	*Mean*	*n*	*Mean*	
Infants PI	4	8·3	33	10·0	37	9·8	10·8
PII	11	18·4	198	15·3	209	15·5	5·3
PIII	94	27·3	1258	25·8	1352	25·9	7·0
PIV	623	42·6	3254	38·9	3877	39·5	16·1
PV	345	51·6	685	46·8	1030	43·6	33·5
Secondary	1	—	22	59·5	23	59·6	4·3
Total	1078	43·8	5450	35·9	6528	37·2	16·5

(*b*) DISTRIBUTION OF HIGH SCORERS BY CLASS IN SCHOOL
(Pupils Previously Tested and Not)

Class in School	*Previously Tested*	*Not Previously Tested*	*Total*	*Previously Tested as Percentage of Total*
Infants PI	0	0	0	0
PII	0	0	0	0
PIII	3	58	61	4·9
PIV	180	759	939	19·2
PV	213	297	510	41·8
Secondary	1	19	20	5·0
Total	397	1133	1530	25·9

(*c*) DISTRIBUTION OF LOW SCORERS BY CLASS IN SCHOOL
(Pupils Previously Tested and Not)

Class in School	*Previously Tested*	*Not Previously Tested*	*Total*	*Previously Tested as Percentage of Total*
Infants PI	4	26	30	13·3
PII	7	153	160	4·4
PIII	26	424	450	5·8
PIV	27	311	338	8·0
PV	3	9	12	25·0
Secondary	0	0	0	0
Total	67	923	990	6·8

of high scorers have been previously tested; for primary IV the corresponding figures are 8·0 per cent of low scorers and 19·2 per cent of high scorers, and for primary V 25·0 per cent of low scorers and 41·8 per cent of high scorers. A larger proportion of previously-tested children exists among the high scorers, especially in the upper classes, but it should be noted that in all classes the majority of both groups have not been previously tested, and the differences in the proportions of the remainder are not sufficiently great to cause a marked difference in test score, even if the effect of previous testing were greater than it appears to be.

It is not our purpose in this chapter to discuss the effects of previous test experience on the group-test score, but we present a summary of the data in table XLI.

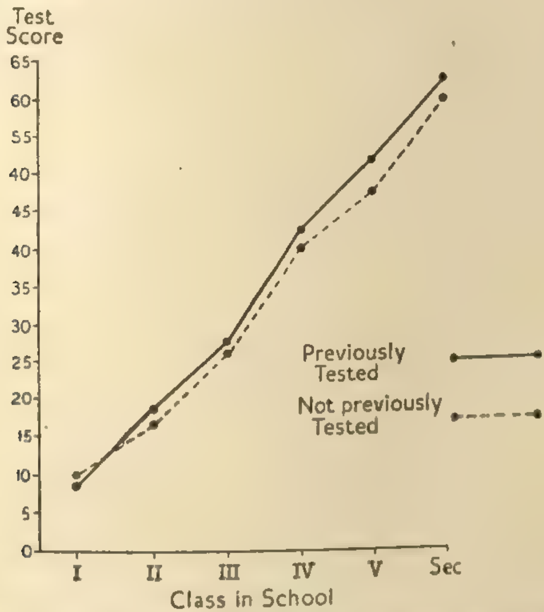

FIGURE 32 Mean Test Score of Pupils Previously Tested and Not Previously Tested, by Class in School

With class kept constant the difference between the average test scores of the pupils previously tested and those not so is

about two points of test score, and even this cannot be taken entirely at its face value, as there still remain differences of age and education authority which may have a bearing on the comparison.

It appears unlikely, therefore, that there is any really significant difference between the two groups in respect of previous test experience. All we can safely say is that more of the high scorers have been previously tested as they are more numerous in those school classes where testing is most likely to occur. No grounds appear for believing that their higher scores are the result of having had more experience of intelligence tests than the low scorers have had.

THE HIGH SCORER—SUMMARY

Most of the findings discussed in this chapter could have been inferred with a reasonable degree of certainty from the data given in the previous chapters of this book. Within either the high-scoring or the low-scoring group the restricted range of test score imposed by the mere fact of selection would tend to damp down any great variations in average test score within such categories as family size or occupational class. Nevertheless it is clear from the analysis of the proportions of high and low scorers in each of such categories that the high and low scorers reflect the general trends which have been noted earlier in this volume. To review briefly the results we have obtained, let us consider the characteristics of the pupil of above average intelligence, as represented by a typical high scorer. The odds are slightly in favour of such a pupil being a boy, and as the level of intelligence rises, so do these odds increase. The intelligent pupil is most likely to be an only child or to have few brothers or sisters. Only a small number of high scorers are members of large families. The high scorer is most likely to be the son of a skilled manual worker, but among his fellow high scorers he will find a large proportion of the children of professional men, employers and salaried employees, and a small proportion of the children of unskilled and agricultural workers. His mother is most likely to be a little older than the mothers of his contemporaries. The high scorer usually lives in a home which is not unduly overcrowded, the home in most

cases containing fewer than two persons per room. In bodily physique the high scorer is also superior to his contemporaries, being over an inch taller and about four pounds heavier; but his physical superiority is not so marked as his intellectual superiority. At school the high scorer has progressed without retardation from class to class, and has in some instances been promoted more rapidly than his contemporaries; he is, however, generally to be found in the school class to which his age would normally assign him. The general picture presented is one of superior endowment coupled with favourable social circumstances.

THE LOW SCORER—SUMMARY

Turning next to the low scorers we find that in many ways the typical low scorer, or pupil of under average intelligence, presents a definite contrast to his high-scoring contemporary, but not in all respects. The low scorer is again most likely to be a boy, and the lower the score, the greater the likelihood. Most of the low scorers have two or more brothers or sisters, and children from the large families are strongly represented. As with the high scorer, the low scorer's father is most likely to be a skilled manual worker, but unlike the high scorer, he is not likely to find among his less intelligent companions any of the children of professional men, or many children of employers, salaried employees or clerical workers. He will, on the other hand, find a considerable proportion of the children of unskilled and semi-skilled workers. His home conditions, too, are not so satisfactory, as in more than two cases out of three he lives in a home with more than two persons per room. Physically also, the low scorer is below average, being about two and a half inches shorter and six and a quarter pounds lighter than his high-scoring contemporary. At school the low scorer tends to be retarded. He may have progressed through school at the normal rate, but it is quite likely that he will be found in a class of children younger than himself, among whom his low intelligence may not be so noticeable. The low scorer is handicapped in various ways. His intelligence is low, he is physically less well-developed, and the social conditions of his home are in some respects below average.

THE VERY LOW SCORER

A further group of low scorers may be of interest. These are the pupils whose test score was designated YY. This score of YY was given to those pupils who, in the opinion of their teacher, were unfit to attempt the test by reason of physical or mental defect. As it is probable that different teachers applied different standards of unfitness, it was decided to include in this very low-scoring group those children who attempted the test, but failed to score any marks. Their scores were recorded as OO. Subsequent information received indicated that in some schools the teachers had not withdrawn any defective children, but had allowed all to attempt the test, so that the combining of the YY and OO scorers is probably the fairest course to take. The nature of the defect was not asked for, so that there is no indication of the proportion of pupils who suffer from mental defect, physical defect, or both. For the thirty-six-day sample, however, it was recorded whether a pupil suffered from any of a list of nine specified defects (congenital paralysis, developed paralysis, deafness, epilepsy, chorea, defective vision, meningitis, encephalitis, and endocrine gland defects).[1] Of the sixty pupils in the thirty-six-day sample scoring OO, twelve were recorded as suffering from one of these defects, and fourteen of the forty-seven children scoring YY were similarly affected. This is the closest estimate that can be made of the relative incidence of physical and mental defect in these pupils; it is clear that the two conditions may both be present, or that a pupil may have been unable to do the test as a result of some physical defect not specified in the list. The incidence of the listed defects among the OO and YY scorers is: developed paralysis, one; deafness, four; epilepsy, one; defective vision, sixteen; endocrine defects, two; the two remaining pupils suffered from deafness and defective vision combined. Approximately a quarter of this particular group of low scorers is accordingly afflicted with one or other of these defects.

The one hundred and seven pupils scoring OO and YY constitute 1·6 per cent of the thirty-six-day sample. The parallel

[1] *The Trend of Scottish Intelligence*, pp 44-5, and appendix to ch III of this volume

figures for the complete 1947 survey are given below, as percentages of the whole group.

Score	*Boys*	*Girls*	*Both*
OO	0·68	0·33	1·01
YY	0·42	0·33	0·75
Both	1·10	0·66	1·76

These low scorers, therefore, constitute 1·76 per cent of the whole survey group, which is close enough to the 1·6 per cent of the thirty-six-day sample to make little difference. The distinct preponderance of boys will be noted. As most of the data with which we are concerned is recorded only for the thirty-six-day sample, the subsequent discussion is confined to the one hundred and seven low scorers in the thirty-six-day sample.

The data for these one hundred and seven pupils are given below in table XLII. Throughout, the entry XX means that the information is unknown, and the comparable data for the whole thirty-six-day sample have been given in the form of percentages.

TABLE XLII

DISTRIBUTION OF THE ONE HUNDRED AND SEVEN PUPILS SCORING OO AND YY IN THE TEST

(*a*) *Size of Family*

	1	2	3	4	5	6	7	8	9	10	11	*Unknown*	*Total*
OO	5	9	8	3	10	11	5	4	2	2		1	60
YY	3	9	6	10	7	4	3	2	2	1			47
Both	8	18	14	13	17	15	8	6	4	3		1	107
Both as Percentage	8	17	13	12	16	14	8	6	4	3		(1)[1]	101
Thirty-six-day Sample as Percentage	11	23	21	16	11	7	5	3	2	1	1		101

Note : The extra one per cent in the total is to avoid decimals throughout

[1] Percentages calculated from the total less the unknown.

TABLE XLII (*continued*)

(*b*) *Occupational Class*

	1	2	3	4	5	6	7	8	9	*Unknown*	*Total*
OO	0	2	0	1	17	12	17	0	10	1	60
YY	0	0	2	0	13	9	14	0	5	4	47
Both	0	2	2	1	30	21	31	0	15	5	107
Both as Percentage	0	2	2	1	29	21	30	0	15	(5)	100
Thirty-six-day Sample as Percentage	3	5	4	8	36	18	17	2	7		100

(*c*) *Occupancy Rate*

	1	2	3	4	*Unknown*	*Total*
OO	1	20	23	14	2	60
YY	2	17	15	12	1	47
Both	3	37	38	26	3	107
Both as Percentage	3	35	36	26	(3)	100
Thirty-six-day Sample as Percentage	8	42	31	19		100

(*d*) *Age of Mother in Years*

	42 +	41-37	36-32	31-27	26-22	21 –	*Unknown*	*Total*
OO	0	7	14	10	22	4	3	60
YY	2	3	7	10	10	10	5	47
Both	2	10	21	20	32	14	8	107
Both as Percentage	12		21	20	33	14	(8)	100
Thirty-six-day Sample as Percentage	12		21	28	29	10		100

(*e*) *Class in School*

	Inf.	*I*	*II*	*III*	*IV*	*V*	*Sec*	*PX*	*Sp*	*Unknown*	*Total*
OO	2	4	13	17	4	0	0	7	13	0	60
YY	2	6	1	5	2	0	0	1	26	4	47
Both	4	10	14	22	6	0	0	8	39	4	107
Both as Percent	4	10	14	21	6	0	0	8	37	(4)	100
Thirty-six-day Sample as Percent	(0·1)	1	2	21	58	15	(0·4)	1	1		100

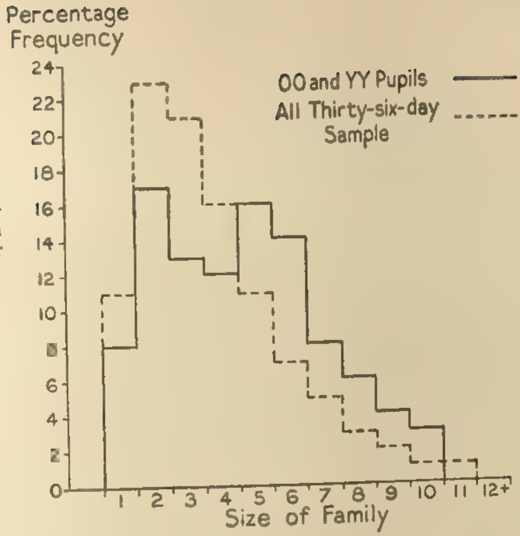

FIGURE 33*a* Percentage Distribution of Size of Family for OO and YY Pupils

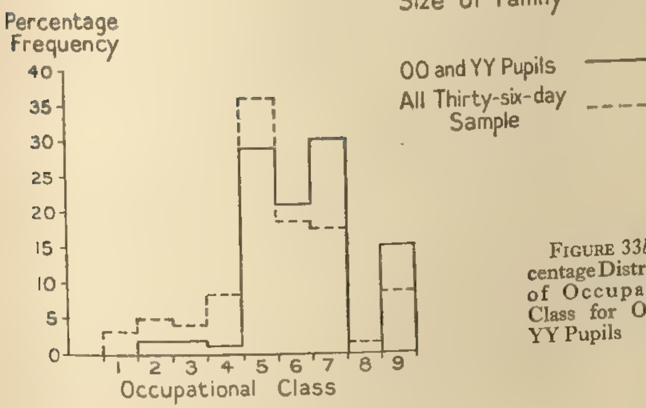

FIGURE 33*b* Percentage Distribution of Occupational Class for OO and YY Pupils

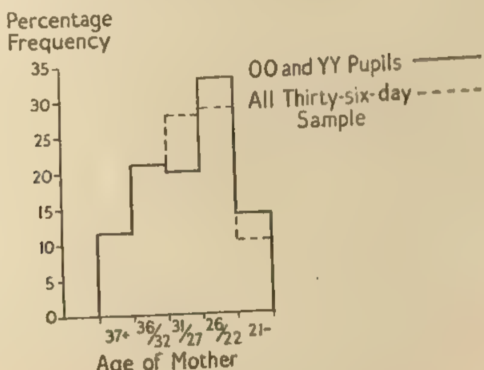

FIGURE 33*c* Percentage Distribution of Age of Mother for OO and YY Pupils

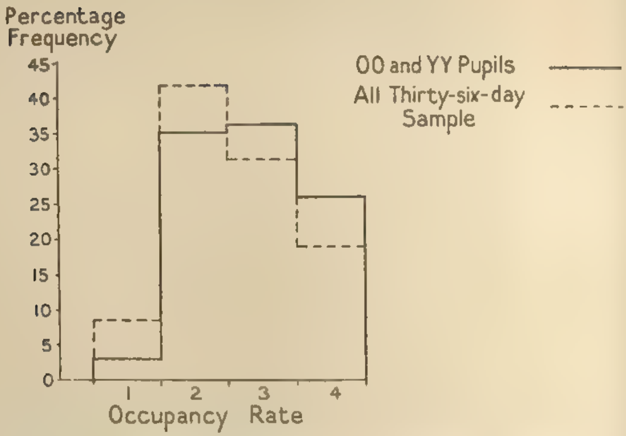

FIGURE 33*d* Percentage Distribution of Occupancy Rate for OO and YY Pupils

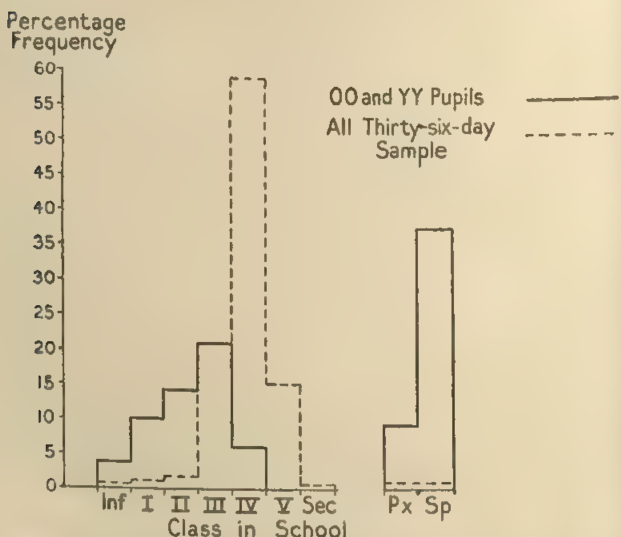

FIGURE 33*e* Percentage Distribution of Class in School for OO and YY Pupils

The preceding tables, and the accompanying diagrams are self-explanatory, and require little comment.

The relatively greater frequency of the larger families may be noted, even though no families larger than ten appear in the group. With a number so small as one hundred and seven, however, sampling may play a part in this, together with the possibility that a defective child may help to terminate the family.

In regard to occupational class, it should be noted that the children of unskilled manual workers are now the largest single group among these low scorers, the children of skilled manual workers, the largest group in the population, coming second. The absence of any low scorers from occupational class 1 (professional men and large employers) and occupational class 8 (farmers) is probably a fairly correct representation of the situation, though, once more, sampling and failure of ascertainment may have to be taken into account.

The incidence of overcrowding is much as would be expected.

Maternal age is once again a factor the influence of which is difficult to analyse. The largest percentage of high scorers have mothers between twenty-seven and thirty-one; in this group of low scorers we find a markedly smaller proportion is born of mothers of this age group. There is a certain preponderance of younger mothers among our low scorers, a fact which can readily be associated with occupational class, but not so easily with family size.

Finally, the children in this very low-scoring group are those whose need of special education is probably most apparent; and we do in fact find more than a third of them in special schools. The remainder are distributed through the lower reaches of the primary school. About a quarter of the very low-scoring group, it will be remembered, are physically handicapped, and it is possible in some instances that the physical handicap may be such as to render the pupil unlikely to be able to do the test, but not to impose too severe an impediment upon school progress. There may also be in the group some pupils who did not do themselves justice in the test, and who may, on another occasion, be able to attain a score higher than zero. Nor is it uncommon for pupils who are of low intelligence, to continue to progress slowly through the school in virtue of age, though they are often to be found in classes the

average age of which is lower than their own. The main features of the school situation, however, stand out clearly. The majority of the very low-scoring group has been unable to fit into the pattern of school progress designed for the pupil of average ability. Nearly all have apparently been found unable to profit from instruction at the normal level; some have been provided with special educational treatment; others have been retained for more than one year in the same class, while their contemporaries progressed through the school at the normal rate. It is noteworthy, nevertheless, that the divergence of these low scorers from the standard pattern of school progress is much more marked than that of their intellectually-gifted contemporaries at the other end of the intelligence scale.

These very low scorers, therefore, display even more emphatically the relationship between test score and social and educational conditions than do the low scorers of the whole age group. The association of intellectual or physical defect with increase in family size, lower socio-economic status, overcrowding and educational retardation is, despite the exceptions, clearly shown.

Since a number of this group of one hundred and seven pupils fall into the six-day sample, we are able to make a rough estimate of the average IQ of the very low scorers. Table XLIII gives the distribution of Binet IQ for the fourteen pupils of the group who were tested individually.

TABLE XLIII

Distribution of Binet IQ for Pupils Scoring OO and YY in the Test

	Binet IQ							
	50-4	55-9	60-4	65-9	70-4	75-9	80-4	*Total*
OO	—	—	1	5	1	—	1	8
YY	1	3	1	1	—	—	—	6
Both	1	3	2	6	1	—	1	14

Mean IQ: 64·5

These fourteen pupils from the whole group of very low scorers are a random selection by day of birth, and we may therefore take their average IQ as the best estimate available of the IQ of the pupils who scored zero or YY on the group

test. It appears as if the main reasons for their inability to do the test were intellectual rather than physical defect, though it should be stated that the two children with IQs over seventy are not recorded as suffering from any of the physical defects specified in the sociological schedule.

CONCLUSION

One of the objects of this chapter is to bring into clearer focus, by considering separately the two extremes of the range of test score, the relationship between intelligence and social conditions. Though certain general trends have emerged fairly clearly from this consideration, it is equally clear that these are general trends only, and that a substantial amount of departure from them exists. Though the low scorers, for instance, tend to be members of the larger families, yet we find that for every eight low scorers from families of twelve or more children, there is one high scorer. And the most frequent size of family for the low scorers is one of three children. It should be noted here that, as the number of high scorers is greater than that of low scorers by approximately the ratio of three to two, this, and subsequent comparisons are biased somewhat in favour of the high scorers. Probably a frequency of one high scorer to twelve low scorers for families of twelve or more children would be a fairer statement of the position. Nevertheless it still remains true that any statements about the relation between intelligence and family size must be made with reservations. The same applies to occupational class. The children of skilled manual workers supply 549 of the 1,552 high scorers, and 368 of the 1,099 low scorers. In both the high and the low scorers these pupils form the largest single group from any occupational class. The pupils from occupational classes 1 and 3 (professional men and large employers; salaried employees) are those with the highest average test score. There are 237 high scorers from these two classes. But there are also 196 high scorers among the children of unskilled manual workers and agricultural workers, the two classes whose average test score is lowest. With regard to occupancy rate in the home, the homes with three or more persons per room produce 350 low scorers, but also 146 high scorers. These are

quite substantial exceptions to any general rule, and further instances may be culled from the tables in the appendix to this volume.

As we noted earlier, every level of social background contributes some pupils to the high scorers, and intelligent pupils are found even in the most adverse social conditions. But it is also significant that we fail to find, to the same degree, low scorers in favourable circumstances. There are no low scorers in occupational class 1, and only thirty-one in the homes with fewest persons per room. Our measure of social conditions is admittedly a limited one, but within these limits it appears that high intellectual ability is more widely distributed over different social environments than is low intellectual ability.

VII

THE TWINS[1]

Of the 75,451 children included in the Scottish mental survey, 1,070 were recorded as twins. On further investigation, twenty of these were found to be single survivors of pairs, and were excluded from the twin group, leaving 525 pairs of twins, or 1,050 children. The number of pairs of twins born in Scotland in 1936 is given by the Registrar-General for Scotland as 1,047. Almost exactly half of these pairs, therefore, appear to have survived as complete pairs to the age of eleven. To what extent the loss is due to death and to what extent to failure of ascertainment by the mental survey is not known. What evidence there is, points to a heavier mortality among twins than among non-twins, especially in the earlier years of life. Newman[2] quotes an American investigation where 1,051 twins were found in a school population of 75,013. These figures are very similar to our own. Newman also refers to Viennese data giving the death rate for the first two weeks as 23·4 per cent for twins and 8·9 per cent for singletons. A German investigator, Essen-Moller, is quoted[3] as stating that seventy per cent of twins survive to adulthood. Whether this statement refers to individuals or to complete pairs is not clear. Should it refer to individuals, then it is quite consistent with the other findings that approximately fifty per cent of complete pairs survive the earlier years of life. Dahlberg[4] quotes an English insurance company as finding that, out of 279 pairs of twins, only 142 complete pairs survived the first five years of life.

[1] The Committee record their indebtedness to the editor of *Population Studies*, in which the substance of this chapter has already appeared (vol III, No 3 and vol IV, No 3).

[2] H H Newman, *Twins and Super-Twins*. London: Hutchinson & Co Ltd, 1942, p 34

[3] Ruggles Gates, *Human Genetics*. New York: The Macmillan Company

[4] Gunnar Dahlberg, *Twin Births and Twins from a Hereditary Point of View*. Stockholm, 1926

Owing to the lack of evidence on which to base a more precise estimate of the mortality of twins, it is not possible to assess the degree of failure of ascertainment. All the evidence points to the conclusion that the mortality of twin children is appreciably greater than that of non-twins, and it is probable, therefore, that the failure of ascertainment of twins in the Scottish mental survey is not so great as would at first sight appear to be.

Of the 1,050 recorded twins the group intelligence test score is known for 974, 469 boys and 505 girls, the remaining 76 being absent from school on the day of the test. The proportion of absentees for the twins, 7·24 per cent, is a little higher than that for the survey children as a whole, namely 5·86 per cent. The 974 twins, however, are not all pairs. The number of pairs of twins for whom the test score is known for both members of the pair is 468. The non-twins with whom the twins are compared consist of the remainder of the survey children for whom the relevant data are available.

Table XLIV shows the distribution of test score for twins and non-twins, and table XLV gives a comparison of the means and standard deviations of these scores. The significance ratio, column 6 in table XLV and the *F* ratio, column 7, are measures of the statistical significance of the differences of the means and standard deviations respectively. If either ratio exceeds three, the probability of such a difference occurring by chance alone is negligible.

The most outstanding feature of these results is that the intelligence of twins, as measured by the test, is markedly lower than that of the non-twins. The difference of 4·83 points of test score is roughly equivalent to about five points of IQ. The mean age of our twins is 131·4 months and that of non-twins is likewise 131·4 months. The distributions of age in the twins and non-twins are not significantly different. The results of previous investigations into the comparative intelligence of twins appear to be much the same. Merriman (1924)[1] using Stanford Binet, Army Beta and National Intelligence Tests on over one hundred pairs of twins, reported a median IQ of 97 for twins, but concluded that 'twins suffer no

[1] C Merriman, 'The Intellectual Resemblance of Twins'. *Psychological Monographs*, vol XXXIII, No 5, 1924

intellectual handicap'. Lauterbach (1925),[1] on the basis of 208 pairs of twins tested by National Intelligence Tests and the Terman Group Test of Mental Ability, found no evidence that twins were intellectually handicapped. The median IQ of

TABLE XLIV

Frequency Distributions of Test Score for Twins and Non-twins

Test Score	*All Twins*		*All Non-twins*		*Boy Twins*		*Boy Non-twins*		*Girl Twins*		*Girl Non-twins*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
70-76	1	0·10	200	0·29	0	0·0	111	0·31	1	0·20	89	0·26
65-69	14	1·44	1176	1·68	5	1·07	633	1·79	9	1·78	543	1·57
60-64	24	2·46	2851	4·08	14	2·99	1405	3·98	10	1·98	1446	4·19
55-59	45	4·62	4841	6·93	23	4·90	2393	6·74	22	4·36	2448	7·10
50-54	76	7·80	6985	10·00	35	7·46	3468	9·81	41	8·12	3517	10·20
45-49	80	8·21	8497	12·17	28	5·97	4037	11·42	52	10·30	4460	12·93
40-44	96	9·85	8862	12·69	42	8·96	4243	12·02	54	10·69	4619	13·39
35-39	105	10·78	8163	11·69	48	10·23	3947	11·17	57	11·29	4216	12·22
30-34	114	11·70	6917	9·91	54	11·51	3444	9·75	60	11·88	3473	10·07
25-29	94	9·65	5515	7·90	41	8·74	2766	7·83	53	10·50	2749	7·97
20-24	77	7·91	4392	6·29	40	8·53	2259	6·39	37	7·33	2133	6·18
15-19	76	7·80	3643	5·22	38	8·10	1964	5·56	38	7·52	1679	4·87
10-14	57	5·85	2813	4·03	29	6·18	1551	4·39	28	5·54	1262	3·66
5-9	62	6·37	2274	3·26	37	7·89	1396	3·95	25	4·95	878	2·55
0-4	53	5·44	2702	3·87	35	7·46	1723	4·88	18	3·56	979	2·84
Total	974		69831		469		35340		505		34491	

TABLE XLV

Mean and Standard Deviation of Test Score for Twins and Non-twins

	Group	*n*	*Mean*	*Standard Deviation*	*Standard Error*	*Significance Ratio*	*F Ratio*
1	All twins	974	31·92	16·52	0·529	9·07	1·06
	All non-twins	69831	36·754	16·03	0·061		
2	Boy twins	469	30·33	17·13	0·791	6·98	1·06
	Boy non-twins	35340	35·881	16·63	0·088		
3	Girl twins	505	33·39	15·81	0·703	6·01	1·06
	Girl non-twins	34491	37·649	15·33	0·083		

Lauterbach's twins, however, is reported as 95. Holzinger (1929)[2] found that twins had the same average intelligence as unselected children. Wingfield and Sandiford,[3] in a study of

[1] C E Lauterbach, 'Studies in Twin Resemblance', *Genetics*, vol X, 1925, pp 525-68

[2] K J Holzinger, 'The Relative Effects of Nature and Nurture Influences on Twin Differences', *Journal of Educational Psychology*, vol XX, 1929, pp 241-8

[3] A H Wingfield and P Sandiford, 'Twins and Orphans', *Journal of Educational Psychology*, vol XIX, 1928, pp 410-23

102 pairs of twins, state that 'twins as a group are very slightly —one to two per cent—below the average of the population in general intelligence, but show about the same degree of variability as unselected children'; 97·2 and 96·8 IQ are given for the mean and median respectively.

The Scottish mental survey data therefore agree in the main with previous findings in the same field. The degree of inferiority in the intelligence of our Scottish twins appears to be a little greater than that previously reported, but it must be remembered that comparison is made here with the whole population of non-twin children of the same age, and that the size of the twin group is considerably larger than that of previous investigations. The whole trend of the evidence, therefore, points to the conclusion that twins as a group tend to be lower in intelligence than non-twins, to the extent of four to five points of IQ.

Further, the data summarised in tables XLIV and XLV lend no support to the view that one member of a pair of twins is frequently of very low intelligence. Apart from the fairly high correlation, $r = +0{\cdot}7$, between the test scores of twin pairs, there is no sign of a bunching of the distribution of twins' test scores at the lower end. The number of twins scoring 0-4 points in the test is not disproportionately greater than that of the non-twins. The standard deviations of test score of twins and non-twins are not significantly different. There appears, in fact, to be a fairly uniform superiority of non-twins over twins throughout the whole range of intelligence test scores, at least as far as surviving pairs of eleven-year-olds are concerned.

It will be noted from table XLV that the girl twins have a higher mean test score than the boy twins. The difference between boys and girls is 3·06 points of score for the twins and 1·77 points for the non-twins, both differences being in favour of the girls. This larger sex difference of test score for twins is not entirely what we should have expected. No one of the non-twins is related as brother or sister to any other non-twin, but of the 974 twins, 364 are brothers and sisters, making 182 unlike-sex pairs. In these 182 pairs of unlike-sex twins we are comparing the test scores of a set of brothers with their twin sisters, and in the remaining set of twin pairs we are comparing

a set of boys with a set of unrelated girls, as in the non-twins. A more detailed analysis of the twins' scores is accordingly given in table XLVI.

TABLE XLVI

MEAN TEST SCORE OF TWINS

	Group	*n*	*Mean Score*	*Standard Deviation*	*Standard Error*	*Significance Ratio*	*F Ratio*
1	Boy twins	469	30·33	17·13	0·791	2·89	1·77
	Girl twins	505	33·39	15·81	0·703		
2	Like-sex boy twins	264	29·37	17·72	1·091	2·65	1·24
	Like-sex girl twins	308	33·14	15·98	0·911		
3	Like-sex twins	572	31·40	16·89	0·706	1·49	1·15
	Unlike-sex twins	364	33·02	15·77	0·826		
4	Boys of unlike-sex prs	182	32·23	16·06	1·191	1·24	1·11
	Girls of unlike-sex prs	182	33·48	15·28	1·133		
5	Like-sex boy twins	264	29·37	17·72	1·091	1·77	1·22
	Unlike-sex boy twins	182	32·23	16·06	1·191		
6	Like-sex girl twins	308	33·14	15·98	0·911	0·23	1·09
	Unlike-sex girl twins	182	33·48	15·28	1·133		

When we confine the comparison to the boys and girls of the unlike-sex pairs of twins, that is, if we compare brothers with their sisters, the sex difference becomes much smaller than for all twins, the difference of 1·25 points in favour of the girls not being statistically significant. On the other hand, the difference between the mean test scores of boys and girls of like-sex pairs, where none of the boys is related to any of the girls, is quite a considerable one, being 3·77 points in favour of the girls. It would therefore appear that for unrelated sets of twins the sex difference in test score is appreciably greater than it is for non-twins.

The proportion of girls in the twin group is 52 per cent of all twins, and in the non-twin group of the whole survey the proportion of girls is 49·4 per cent. The slightly greater proportion of girls among the twins will therefore tend to increase the average score of the twins by a small amount over what it would have been had the sex ratio been the same for twins and non-twins. When an adjustment is made for the difference in sex ratio, however, the increase in the difference between the average score of the twins and the non-twins amounts to only 0·07 points of score, which is so small as to be negligible.

There is no apparent reason for this greater sex difference in test score for twins. It is difficult to imagine how any environmental influences likely to cause a sex difference in average test score should be more potent with twin girls than with non-twin girls. It is just possible that for twins the sex difference in test score may be related to birth-weight and viability.

SIZE OF FAMILY

The influences causing the difference in intellectual level between twins and non-twins deserve investigation. The score on an intelligence test is determined by a number of factors, intellectual capacity being the main one. But educational standard and past experience of tests also operate. These again are related to the child's educational history generally, including such items as school attendance, changes of school, wartime evacuation, and so forth. Another set of influences are those connected with the socio-economic status of the child's family, the size of the family and the child's position in the family. All these, and other factors, would require to be held constant before the intellectual difference between twins and non-twins could be assigned to twinning as such.

In *The Trend of Scottish Intelligence* (chapter VII) tables are given which show the average intelligence test score of eleven-year-old children for each size of family and for each position in the family.[1] The general trend of the figures indicates an average decrease of about 1·5 points of test score per unit increase in the size of family. The correlation between test score and size of family is given as $r = -0{\cdot}28$. There is no clear relationship between test score and position in family.

Two considerations present themselves. First, we have to establish whether a similar relationship between test score and size of family exists for twins. Secondly, we must examine the relationship between the size of the families containing our twins and our non-twins. In order to avoid possible confusion

[1] The information on family size and position was recorded in the sociological schedules as a fraction, the denominator being the number of (living) children in the family in 1947, and the numerator being the child's own position or birth order in that family. An entry 3/4 would therefore mean that the child is the third in a family of four children. Surviving children only were counted. For twins, both twins were given the earlier position of the two, the denominator remaining as before.

about whether twins are entered as one birth or as two children, we have presented the results in the form that appears in table XLVII and the tables following. We have taken as our basis for measuring the size of family the number of sibs of each of our eleven-year-old children; and for the position in the family we have taken the number of previously-born sibs. We have also implicitly assumed throughout that the proportion of twins

TABLE XLVII

MEAN TEST SCORE FOR TWINS AND NON-TWINS BY SIZE OF FAMILY

(1) *Number of Sibs*	(2) *Number of Non-twins*	(3) *Mean Score*	(4) *Number of Twins*†	(5) *Mean Score*	(6) *Difference of Means* (3) − (5)
0	7690	42·10	161	38·68	3·24
1	15756	41·81	196	36·23	5·58
2	14423	38·38	165	33·24	5·14
3	10811	35·42	131	30·47	4·95
4	7549	32·62	123	26·23	6·39
5	4984	30·94	71	26·44	4·50
6	3285	29·52	57	25·51	4·01
7	2078	28·94	28	19·14	9·80
8	1269	28·07	12	17·42	10·65
9	684	27·04	18	22·83	4·21
10	347	27·46			
11	199	25·39 } 25·87	8*	26·25	−0·38
12 +	155	22·92			
Total	69230		970 + 4 size of family unknown = 974		

*Number of twins with ten or more sibs

†For the twins, the number of sibs does not include the other member of the twin pair

among the sibs of our twins and non-twins is the same. And it must be kept in mind throughout that these tables are not statements about Scottish families in general, but about the families of Scottish eleven-year-old children. Some families will be completed, others not.

From table XLVII it is evident that the relationship between size of family and test score is of much the same order for twins and non-twins. Indeed, the decline in intelligence with increasing size of family appears almost to be more marked with

twins, but owing to the rather small number of twins in the larger families, it is not safe to draw any definite conclusion from this. The mean test score of the twins, also, for constant size of family, is running on the average four or five points below that of the non-twins.

TABLE XLVIII

NUMBER OF SIBS AND PREVIOUSLY-BORN SIBS: NON-TWINS

Number of Previously-born Sibs	*Number of Sibs*												
	0	1	2	3	4	5	6	7	8	9	10	11 +	*Total*
0	8068	9688	5751	2750	1175	450	163	53	17	4	1	1	
1	—	6863	5284	2997	1650	778	316	102	36	5	3	—	
2	—	—	4225	3024	1761	1004	548	204	72	25	7	—	
3	—	—	—	2667	1792	1039	612	354	121	46	22	5	
4	—	—	—	—	1673	1010	633	401	241	106	27	18	
5	—	—	—	—	—	1045	622	417	234	113	43	36	
6	—	—	—	—	—	—	642	356	219	112	57	44	
7	—	—	—	—	—	—	—	367	203	134	65	59	
8	—	—	—	—	—	—	—	—	220	97	51	48	
9	—	—	—	—	—	—	—	—	—	103	44	51	
10	—	—	—	—	—	—	—	—	—	—	49	42	
11 +	—	—	—	—	—	—	—	—	—	—	—	75	
Total	8068	16551	15260	11438	8051	5326	3536	2254	1363	745	369	379	73340

TABLE XLIX

NUMBER OF SIBS AND PREVIOUSLY-BORN SIBS: TWINS

*Number of Previously-born Sibs**	*Number of Sibs*														
	0	1	2	3	4	5	6	7	8	9	10	11	12	*Unknown*	*Total*
0	171	80	28	16	6	4	—	—	—	—	—	—	—	—	
1	—	135	56	30	22	4	—	—	—	—	—	—	—	—	
2	—	—	94	31	20	18	8	—	—	—	—	—	—	—	
3	—	—	—	63	30	10	12	2	—	2	—	—	—	—	
4	—	—	—	—	56	18	10	6	—	—	—	—	—	—	
5	—	—	—	—	—	23	14	6	—	—	2	—	—	—	
6	—	—	—	—	—	—	18	6	2	7	—	—	—	—	
7	—	—	—	—	—	—	—	10	5	4	—	—	2	—	
8	—	—	—	—	—	—	—	—	6	—	2	—	—	—	
9	—	—	—	—	—	—	—	—	—	5	—	—	—	—	
10	—	—	—	—	—	—	—	—	—	—	2	—	—	—	
Total	171	215	178	140	134	77	62	30	13	18	6	0	2	4	1050

*cf footnote † to table XLVII

In view of this relationship, if the twins were born into larger families than the non-twins, we should reasonably expect to find a difference of intelligence. The data are presented in

tables XLVIII and XLIX. In table XLIX, it should be noted, every family appears twice, as it has been compiled for individuals, not pairs of twins; and the fact that some numbers are odd is explained by some few pairs of twins whose family had been broken up, and where different information was given about the number of their brothers and sisters. As it was not always possible to discover which was the correct version, we have elected to present the information as it was given.

Tables XLVIII and XLIX require comment on several points. The mean number of sibs of twins is 2·72 ($SD=2{\cdot}20$) and of non-twins 2·77 ($SD=2{\cdot}27$). The difference between them is not statistically significant. It would appear, therefore, that the number of births in the families to which our twins belong is virtually the same as that in the families of non-twins. There is no evidence here that twinning and fertility are related.

When, however, the distribution of twins and non-twins in their sizes of family is examined, some difference is found. Applying the χ^2 test to the distributions of the total numbers of sibs in tables XLVIII and XLIX, we find that the distributions are significantly different. Table L gives these distributions with the frequencies for non-twins reduced proportionately to those of twins.

TABLE L

Distribution of Twins and Non-twins by Number of Sibs
(Non-twins reduced proportionately to Twin Total)

Number of Sibs	0	1	2	3	4	5	6
Twins	171	215	178	140	134	77	62
Non-twins	115·1	236·0	217·6	163·1	114·8	76·0	50·4

Number of Sibs (continued)	7	8	9	10	11 +	*Total*
Twins	30	13	18	6	2	1046
Non-twins	32·1	19·4	10·6	5·3	5·4	1045·8

The most conspicuous divergence is in families of one birth, where the twins out-number the non-twins. Apart from this, the general trend is for twins to appear less frequently in families of two, three, and four births, and for twins and non-twins to appear with approximately equal frequency in families of five and more births. There is no distinct tendency for twins to predominate in the larger families but not in the

smaller ones, a condition which would be necessary before family size could be accepted as a factor explaining the difference of intelligence test scores of twins and non-twins. Further, the relationship between twins and non-twins is complicated by differences in maternal age, so that any precise assessment of differences in test score associated with differences in family size is virtually impossible.

CORRESPONDENCE OF TEST SCORES OF TWINS

It is common knowledge that twins resemble each other more closely than do the other sibs in a family, and test score is no exception to this general rule. The results of the various investigations into the intellectual resemblance of twins are given in table LI.

TABLE LI

INTELLECTUAL RESEMBLANCE OF TWINS

		*Coefficients of Correlation of Test Performances of Twins**				
		Like-sex Twins			*Unlike-sex Twins*	*All Twins*
Author	*Test*	*Boy-boy*	*Girl-girl*	*All Like-sex*		
Merriman 1924	Stanford-Binet (for ages 5-16)	0·88(27)	0·86(40)	0·87(67)	0·50(38)	0·78(105)
Lauterbach 1925	Stanford-Binet (for varying ages)	0·81(71)	0·73(63)	0·77(134)	0·56(78)	0·67(212)
Wingfield 1928	Average of various tests (for constant age)	—	—	0·82(76)	0·59(26)	0·75(102)
Herman and Hogben 1933	Otis (corrected for attenuation)	0·69(126)	0·63(141)	0·66(267)	0·53(138)	—
Scottish Mental Survey 1947	Group Intelligence	0·69(132)	0·75(154)	0·73(286)	0·63(182)	0·69(468)

*The figures in brackets denote the number of pairs of twins

The results of these various investigations are very similar. The values of the correlation coefficients obtained by Merriman and Lauterbach are rather high, owing to their having neglected the effect of age on the correlation. Our results may best be compared with those of Herman and Hogben.[1] Our twins are spread over an age range of one year, but the effect of age on

[1] L Herman and L Hogben, 'The Intellectual Resemblance of Twins', *Proceedings of the Royal Society of Edinburgh*, No 53, 1933, pp 105-29

the correlations is not very great. The correlation coefficient for all our twins, when age is partialled out, is reduced from $r=0{\cdot}69$ to $r=0{\cdot}683$. The correlations for unlike-sex twins were calculated by the usual product moment method, and the intra-class correlations for like-sex twins by Fisher's method of analysis of variance.

The correlation between twins in respect of intelligence is of the order of $r=0{\cdot}7$, the corresponding value usually given for non-twin sibs being $r=0{\cdot}5$. The correlation between like-sex twins is found in all the investigations we have quoted to be higher than that for unlike-sex twins. There is a fairly consistent agreement on these values, and we may safely say that our correlations of 0·73 for like-sex twins and of 0·69 for all twins are fairly typical, though our correlation of 0·63 between unlike-sex twins is a little higher than that found in most of the other studies.

TWINNING AND MATERNAL AGE

In this and in the following sections the data for non-twins is available only for the thirty-six-day-sample children, so it is with these seven thousand or so children that we must compare the twins. But, as shown in chapter I, there is reason to believe that this thirty-six-day sample is a good representation of our whole group of Scottish eleven-year-olds. Our purpose is to examine certain elements in the social conditions of the children, to find whether differences in these conditions provide an explanation of the lower test scores of twins.

Table LII gives the distribution of twins and non-twins by the age of the mother in 1936, the year in which these children were born.

The average age of the mothers of the twins is found to be 35·2 years, while the average age of the mothers of the non-twins is 28·9 years, giving a significant difference of 6·3 years between the average ages of the two sets of mothers. The proportion of twins born to the mothers of different ages is given in the last column of table LII. The proportion of twin births increases steadily up to the age of 39-40 years, after which the proportion of twins diminishes rapidly. Though these data apply to eleven-year-old surviving twins only, the results ob-

TABLE LII

DISTRIBUTION BY AGE OF MOTHER AT BIRTH OF CHILD FOR TWINS AND NON-TWINS

Age of Mother	*Number of Twins*	*Number of Non-twins*	*Ratio of Twins to Non-twins*
45 +	4	43	·093
43-44	13	66	·197
41-42	23	158	·146
39-40	61	233	·262
37-38	73	314	·232
35-36	112	520	·215
33-34	125	597	·209
31-32	130	693	·188
29-30	126	742	·170
27-28	107	848	·126
25-26	72	842	·086
23-24	77	828	·093
21-22	51	663	·077
19-20	16	313	·051
18 –	4	116	·034
All	994	6976	·142

tained are in substantial agreement with those obtained elsewhere. Dahlberg[1] gives tables of data from various countries showing that the greatest proportion of twin births occurs for mothers aged 35-40 years. The returns of the Registrar-General for Scotland for the years 1939 to 1943 inclusive yield the following proportions of twin births per hundred non-twin births, classified by age of mother.

MOTHER'S AGE IN YEARS

Under 19	20-4	25-9	30-4	35-9	40-4	45-9	Over 50
0·57	0·85	1·21	1·50	1·72	1·37	0·39	0·0

Once again the peak maternal age is 35-39 years.

The figures for England and Wales for 1940-1945[2] show that the highest proportion of twin births occurs at the maternal

[1] Gunnar Dahlberg, *loc cit*, p 21 ff

[2] The Committee take this opportunity of expressing their indebtedness to the Registrar-General for England and Wales and to his staff for guidance on the relevant sections of the *Statistical Review for* 1940-1945, Text, vol II, and for much valuable assistance on various matters concerning multiple births.

age of thirty-eight years. There is also evidence that the differences in the incidence of twinning in relation to maternal age is almost entirely a function of dizygotic twinning, the proportion of monozygotic twins remaining more or less constant for different maternal ages.[1]

Since the size of sibship is related to maternal age, the older mothers tending to have the larger families, it would be expected that the sibships of twins would be larger than those of the non-twins. This, however, does not appear to be so. Table LIII gives the mean number of sibs and of previously-born sibs for the twins and the non-twins according to the age of the mother in 1936. The size of the sibship is given as they were in 1947.

TABLE LIII

MEAN NUMBER OF SIBS AND PREVIOUSLY-BORN SIBS FOR TWINS AND NON-TWINS, BY AGE OF MOTHER

	Twins			*Non-twins*		
Age of Mother	*n*	*Mean Number of Sibs*	*Mean Number of Previous Sibs*	*n*	*Mean Number of Sibs*	*Mean Number of Previous Sibs*
42+	23	4·0	4·0	165	4·4	4·1
37-41	151	4·1	3·6	641	3·7	3·2
32-36	284	2·8	2·1	1464	3·1	2·2
27-31	310	2·4	1·6	1907	2·7	1·4
22-26	181	2·1	0·9	2046	2·4	0·8
21–	39	1·6	0·4	676	2·2	0·4
All Ages	988	2·71	1·93	6899	2·77	1·51

Note: For the twins, the number of sibs is exclusive of the other member of the twin pair

For all ages of mother, the average number of sibs of the twins is 2·71 as compared with 2·77 for the non-twins. The twins, therefore, despite the greater average age of the mothers, tend to belong to families in which fewer births have occurred. On the other hand, since one of the births in the twins' families is of necessity a double birth, the twins' families contain a larger number of children. For convenience, however, we shall continue to consider family size in terms of births rather than in terms of children.

[1] (*a*) Dahlberg, *loc cit*, p 26 ff and p 45 ff
(*b*) *Statistical Review for England and Wales*, 1940-1945

The tendency for the sibships of twins to be smaller than those of non-twins is apparent for each maternal age group in table LIII, except for mothers aged 37-41, where the mean size of the sibship of twins is greater than that of non-twins. The fact that mothers aged 37-41 are also those bearing the highest proportion of twins is probably a chance coincidence. There is, therefore, no evidence that twinning is associated with increased fertility of the mother. After reviewing the available evidence, Dahlberg[1] concludes: 'The statement generally set forth, that twin mothers [i e, mothers of twins] have increased fertility, has no foundation. On the contrary, it may be statistically regarded as proved that they have no increased real fertility.'

On the other hand, the Registrar-General's returns for England and Wales for the seven and a half years ending in 1945 give tables showing the numbers of previous children for mothers of twins and singletons born in the period mentioned. For each age of mother, the average number of previous children is greater for mothers of twins than for mothers of singletons. Our Scottish mental survey figures, as given in table LIV tend to show the opposite. It may be noted in passing that our non-twin group does not contain any triplets or other multiple births. If, however, we make the initial assumption that the data for number of previous children for English mothers giving birth to children during the 1938-1945 period are similar to those for Scottish mothers in the year 1936, the apparent contradiction can be resolved by remembering that our children are all eleven years of age. It is possible, therefore, that the families of the mothers of the non-twins have increased during the eleven years to a greater extent than those of the mothers of twins. This implies a tendency for a twin birth to reduce, to some degree, future fertility, or, conversely, for the incidence of twinning to increase with parity. Another possible element in the situation is the relationship between size of family and twin mortality in the first eleven years of life. No information appears to be available on this point.

The tendency for the sibships of our eleven-year-old twins

[1] *Loc cit*, p 38

to be somewhat smaller than those of the non-twins raises the question of the effect of twinning on subsequent family development. Examination of table LIII reveals very little difference between the average number of previously-born sibs for twins and non-twins. There is only a very slight tendency for the number to be greater for the non-twins. The situation is probably more clearly exhibited in table LIV, wherein we have set out for each age group of mothers the percentage of our twins and non-twins who are last-born in each size of family. Not all families are complete, but if a child is recorded as last-born, it means that there have been no subsequent births for a period of eleven years.

TABLE LIV

PERCENTAGE OF LAST-BORN CHILDREN FOR TWINS AND NON-TWINS BY AGE OF MOTHER

Age of Mother		*n*	*Number of Sibs* 0	1	2	3	4	5	6	7	8	9+
42+	Twins	23	100	100	60	100	0	100	100	100	0	0
	Non-twins	165	100	82	90	91	86	69	84	75	100	90
37-41	Twins	151	100	83	85	92	81	63	60	80	29	0
	Non-twins	641	100	77	82	73	67	58	69	37	38	29
32-36	Twins	284	100	63	71	51	29	50	30	22	29	0
	Non-twins	1464	100	60	54	45	34	31	21	8	14	8
27-31	Twins	310	100	68	43	50	28	18	13	0	0	0
	Non-twins	1907	100	39	30	18	10	4	5	0	0	3
22-26	Twins	181	100	53	22	0	0	0	0	0	0	0
	Non-twins	2046	100	26	10	7	2	4	5	3	0	0
21 –	Twins	39	100	33	0	0	100	0	0	0	0	0
	Non-twins	676	100	11	4	3	5	6	0	0	0	50
All	Twins	988	100	63	53	45	42	30	29	33	46	28
Ages	Non-twins	6899	100	41	28	23	21	20	18	16	16	14

With few exceptions, the proportion of last-born children is greater for the twins than the non-twins. This trend, though fairly clearly evident, must be regarded, however, as suggestive rather than conclusive. Further, it is not clear whether any such limitation of subsequent family size is the result of voluntary action on the part of the parents, or the result of impaired fertility of the mother consequent upon a twin birth. The greater age of the mothers of twins must also be taken into account. In table LIV the figures for all ages of mother combined show a much greater proportion of last-born twins than appears for each group of mothers taken separately. It is

possible that if the age groups of mothers, given in table LIV in groups of five years, were broken down into still smaller groups, the tendency would become less marked; but the numbers of twins would then become too small to enable any definite trends to become evident. Further, there is evidence given in the report on Family Limitation by Dr E. Lewis-Faning[1] that the use of birth control becomes more frequent the more recently-married the woman, and that the more recently-married women use birth control at a shorter interval after the date of marriage than the women married for a longer period. As the mothers of twins are on the average older than the mothers of non-twins, they will, in general, tend to have been married for a longer period. There is no evidence, therefore, that age for age, the mothers of twins are more likely to adopt birth control as a means of family limitation than the mothers of non-twins. Whether the birth of twins leads to a greater tendency to voluntary limitation of family size is not known. It is possible, but there is no evidence. Finally, the mothers of the twins are nearer the termination of their child-bearing period than the mothers of the non-twins, by virtue of greater average age. If maternal age were not taken into account it would be reasonable to expect, as we do in fact find, that the position in the family of twins is later than that of non-twins. When, however, we take mothers of the same ages, there should be no reason to expect that the twins should be born later in the family than the non-twins. But we have seen that there is reason to suspect that they are.

At the best, our evidence is insufficient and can only point to negative conclusions. We have found that the sibships of twins are, if anything, smaller than those of the non-twins, despite the greater average age of the twins' mothers. But as we do not know the duration of marriage, we have no means of assessing the relative fertility of the two sets of mothers. The matter is further complicated by certain considerations of social status. As we shall show later, there is a greater proportion of twins born to mothers whose husbands are professional

[1] 'Family Limitation and its influence on human fertility during the past fifty years', Papers of the Royal Commission on Population, vol I, HMSO, 1949; see especially ch VIII

men and employers than there is born to mothers whose husbands are unskilled manual workers. The difference of proportion is not very great (see table LVIII); but we also know that the mothers in the professional and employer class are on the average older than those in the unskilled manual worker class, so the greater proportion of twins is not entirely unexpected. We also know, however, that the former set of mothers marry later, have smaller families and probably practise birth control to a greater extent than the latter set of mothers. Such social differences are but one of the factors which makes a comparison of the fertility of mothers of twins and non-twins extremely hazardous. The conclusion appears to be that there is no evidence of greater fertility in mothers of twins, at any rate when the possible inhibitory effect of twinning on further enlargement of family size is taken into account.

The main purpose of this study, however, was to examine the relationship between the intelligence of twins and non-twins. In table LV is given the average score in the group intelligence test for twins and non-twins for each age of mother.

TABLE LV

MEAN AND VARIANCE OF TEST SCORE FOR TWINS AND NON-TWINS BY AGE OF MOTHER

Age of Mother	*Twins* *n*	*Mean*	*Variance*	*Non-twins* *n*	*Mean*	*Variance*	*Difference of Means*	*t*
37 +	168	29·74	299·04	748	36·10	272·04	6·36	4·3
32-36	268	32·91	277·53	1370	38·09	269·76	5·18	4·7
27-31	294	33·62	274·13	1773	38·37	256·73	4·75	4·6
22-26	157	29·23	262·95	1888	36·34	248·79	7·11	5·3
21 –	37	30·78	181·12	657	34·02	231·71	3·24	1·4

The relationship between age of mother and average intelligence test score is, within the limits of sampling variations, the same for twins and non-twins. For both, the children of older mothers have a lower mean score, and similarly for both, the children of younger mothers have a lower mean score. The noteworthy feature is that for each age group of mothers the twins are scoring on the average about five points less in the intelligence test. This is clearly of the same order as the difference between the average score for all twins and non-twins regardless of the mother's age. It is reasonably certain, there-

fore, that the difference between the average intelligence test scores of twins and non-twins is not related to differences of mother's age, as this difference remains fairly constant for all maternal ages. The smaller difference for mothers under twenty-one years old does not affect the general picture. The numbers for these are comparatively small, so that the possibility of sampling fluctuation is accordingly larger. But the main conclusion is clear. Despite the differences in family structure which we have been discussing, the average level of the twins' intelligence remains lower than that of the non-twins.

OCCUPANCY RATE OF THE HOME

The information obtained about the homes of the thirty-six-day sample and the twins included particulars about the number of rooms in the home and the number of persons inhabiting the home. The data, expressed in the form of the ratio of persons per room, were classified according to the code indicated earlier (see p 40).

Table LVI gives the relative incidence of overcrowding in the homes of twins and non-twins.

TABLE LVI

PERCENTAGE DISTRIBUTION OF OCCUPANCY RATE FOR TWINS AND NON-TWINS

Occupancy Rate	*Twins*	*Non-twins*	*Difference*
1	6·5	8·4	−2·1
2	43·5	41·9	+1·6
3	33·3	31·1	+2·2
4	16·6	18·6	−2·0
	99·9	100·0	

The differences between the twins and the non-twins are comparatively small, and show no clearly defined trend. Direct comparison may, perhaps, be a little misleading, for in a small home the presence of a pair of twins in the family may be sufficient to raise the code number to a higher degree. Further, when the distributions are compared by the χ^2 test, we find that they are not significantly different at the five per cent level of confidence. In short, there appears to be no signi-

ficant difference between the twins and the non-twins for occupancy rate of the home.

As we might have expected, the average intelligence test score varies according to the occupancy rate. The data for the twins and non-twins are given in table LVII.

TABLE LVII

MEAN AND VARIANCE OF TEST SCORE FOR TWINS AND NON-TWINS BY OCCUPANCY RATE

Occupancy Rate	Twins *n*	Twins *Mean*	Twins *Variance*	Non-twins *n*	Non-twins *Mean*	Non-twins *Variance*	*Difference of Means*	'*t*'
1	63	44·30	244·21	562	47·35	220·39	3·05	1·48
2	419	35·37	277·76	2799	39·38	241·19	4·01	4·63
3	321	29·09	219·38	2080	34·47	233·16	5·38	6·03
4	160	24·34	232·37	1247	30·34	255·62	6·00	4·66
	963			6688				

The mean test score for both twins and non-twins decreases steadily as the occupancy rate increases. This scarcely requires comment. But what we again note is that the difference of mean score between twins and non-twins again remains relatively constant for the varying occupancy rates. The inferiority of the twins' test score tends to become more marked as the degree of overcrowding increases. There is no obvious reason why twins in crowded homes should be relatively less intelligent than non-twins in similar homes, and while an explanation is possible in terms of family size, any attempt at interpretation is both speculative and complex. The safest conclusion to draw is that the tendency for twins to have lower scores in the intelligence test persists through any differences related to occupancy rate, in the same way as it did through differences related to the age of the mother.

OCCUPATIONAL CLASS

For an index of the socio-economic status of the home the occupations of the father, classified according to the code indicated earlier, were taken (see p 38).

There are in table LVIII three occupational classes in which the incidence of twins and non-twins is distinctly different. Occupational classes 1 and 2, where there is a relatively large number of twins, is composed of the professional and

TABLE LVIII

PERCENTAGE DISTRIBUTION OF OCCUPATIONAL CLASS FOR TWINS AND NON-TWINS

Occupational Class	*Twins*	*Non-twins*	*Difference*
1	5·6	3·4	2·2
2	6·2	4·9	1·3
3	3·5	3·6	−0·1
4	8·5	8·3	0·2
5	36·4	36·1	0·3
6	17·5	18·0	−0·5
7	13·4	17·1	−3·7
8	2·9	2·2	0·7
9	5·9	6·5	−0·6
	99·9	100·1	

employer group, and class 7, where there is a marked deficiency of twins, consists of the unskilled manual workers. We also know[1] that children from classes 1 and 2 are characterised by higher intelligence test scores, smaller sibships and, on the whole, older mothers than the children from most other classes. On the other hand, children from class 7 are characterised by lower intelligence test scores, larger sibships, and younger mothers. The whole presents a rather complex biological and social picture which we shall examine after giving the data which relate intelligence test score to occupational class.

TABLE LIX

MEAN AND VARIANCE OF TEST SCORE FOR TWINS AND NON-TWINS BY OCCUPATIONAL CLASS

Occupational Class	*Twins* *n*	*Twins* *Mean*	*Twins* *Variance*	*Non-twins* *n*	*Non-twins* *Mean*	*Non-twins* *Variance*	*Difference of Means*	'*t*'
1	54	44·50	207·34	221	51·82	156·79	7·32	3·42
2	59	39·97	236·31	320	42·59	218·14	2·62	1·21
3	34	45·97	151·18	236	47·66	179·46	1·69	0·74
4	81	37·34	241·10	544	43·92	184·19	6·58	3·49
5	349	31·23	263·48	2359	37·42	240·27	6·19	6·69
6	168	26·94	226·34	1174	33·36	237·87	6·42	5·49
7	128	27·12	239·55	1118	31·15	249·49	4·03	2·78
8	28	34·50	302·78	142	36·16	245·03	1·66	0·47
9	57	23·40	222·10	423	32·56	257·21	9·16	4·32
	958			6537				

[1] cf chapters III and IV

A rather curious divergence from the general trend occurs within class 1. If we sub-divide the class into the professional group and the employers of ten or more workers, we obtain the following:

Occupational Class	*Twins* *n*	*Mean*	*Variance*	*Non-twins* *n*	*Mean*	*Variance*	*Difference of Means*
Professional	39	42·00	227·63	143	54·28	121·38	–12·28
Employers	15	51·00	104·29	78	47·32	192·43	3·68

Some parents with professional qualifications may also be employers, but such parents have been classified only as professional. There is no evident reason for this discrepancy, and in view of the small numbers of twins, it is probably a sampling variation. The small variance of the twins in the employers' group makes us suspect the absence, probably due to chance, of the 'tail' of the distribution of test score for these twins.

Considering table LIX as a whole, no very clear trends are apparent. The rank order of the various classes for mean test score is broadly the same for twins and non-twins. But the differences between the test scores of twins and of non-twins for each class are not uniform. The smallest differences occur in the occupational classes where the numbers of children are smallest; hence these differences are less likely to be significant by the 't' test. But this does not alter the fact that the observed differences between twins and non-twins in these classes are small. We can offer no convincing explanation why the difference between intelligence test scores of twins and non-twins should be less for children of small employers, salaried workers, and farmers than it is for other children. There is no apparent common factor in these three classes, at least for size of families, age of mother, occupancy rate, or incidence of twins.

The results given in table LIX complicate rather than clarify the picture presented by table LVIII. In table LVIII the largest proportion of twins appears in the professional and employer class, a fact which may be related to the greater age of the mothers of these children. Further, there are indications that the mortality rate of twins is higher than that of non-twins. It is possible that the somewhat better home conditions enjoyed by most of these twins is conducive to a higher survival rate, as a result of which there is not only a greater proportion of

twins in this group, but there may also be a greater proportion of the less well-endowed twins surviving. The converse applies to the twins in class 7, the children of unskilled manual workers. There the mothers are younger than the average, and they have larger families. The tendency for the birth of twins to complete the family would have the effect of creating a greater disproportion between the families containing and not containing twins, where the non-twin families tended to be large. The difference in intellectual level of twins and non-twins remains, but is not quite so marked. Though this is a possible interpretation of the differential incidence of twins in these occupational classes, it cannot be regarded as a general trend. It is difficult to conceive why the influences at work in the professional and employer group should not be operative with the children of salaried employees. Any distinction in socio-economic status is very slight. Nor is it clear why the difference of intellectual level of twins and non-twins should be most marked in both the professional class and the agricultural workers. There is also some reason to suspect that ascertainment of twins was not equally complete in all areas of Scotland, and this may have some bearing on the comparison of classes.

From our consideration of the occupational class of the parents of twins two reasonably clear conclusions emerge. One is that a somewhat greater proportion of twins exists in families of the professional-class fathers than in the families of unskilled manual workers, whatever the reason may be. The other is that throughout the variations of class the twins remain of lower average intelligence, as measured by the group intelligence test, than the non-twins.

CONCLUSION

After reviewing the evidence presented in this chapter, we find that the original difference of about four or five points of IQ between twins and non-twins has not been accounted for in terms of possible differences in age, family structure, or socio-economic environment. Age, size of family, age of mother, overcrowding in the home, and socio-economic status of the parent are all correlated with intelligence test score. And though we have found that there is considerable variation

in intelligence test score for both twins and non-twins throughout the range of these variables, the twins show a very marked tendency to remain at a constantly lower level of score than the non-twins. We set out to examine the hypothesis that the difference between the mean intelligence test scores of twins and non-twins could be due to differences in familial and environmental conditions. The facts have failed to support such a hypothesis.

The intellectual inferiority of twins, which has also been observed by other investigators, must therefore either be due to factors about which we have no adequate information at present, or, more probably, to factors inherent in twinning as such.

VIII

THE SOCIAL BACKGROUND OF THE THIRTY-SIX-DAY SAMPLE

In previous chapters we have commented in passing upon the various sociological implications of the survey. We propose now to gather the threads together and see what picture of the living conditions of the children can be drawn from the information obtained in the survey. It must be remembered throughout that our information relates to children only, and is gathered from such families as contain an eleven-year-old child. Our findings do not apply to the whole population of Scotland. The incidence in the survey of the various occupational classes, for instance, is determined by the number of children from each of these classes, so that the proportion of the occupational groups in which the marriage rate and average family size is high will be greater in the survey than it is in the population as a whole. But the survey data do provide, we believe, a good representation of the social and family conditions of children throughout Scotland.

OCCUPATIONAL CLASS

The central influence in the children's social and family environment appears to be the occupation of the father. In the social background of the thirty-six-day sample, for all the aspects which we are considering—intelligence, family size, mother's age, housing conditions, migration, height and weight, there is a similar pattern of variation according to occupational class. This pattern is clearly shown in figure 34. Differences in vertical scale between the different graphs can, of course, be disregarded, being due only to the different intervals selected for plotting. For reference the code is here repeated.

Occupational Class	
1	Professional, and employers of ten or more workers
2	Self-employed, and employers of less than ten workers
3	Salaried employees
4	Non-manual workers paid weekly or more frequently
5	Skilled manual workers, paid weekly or more frequently
6	Semi-skilled manual workers paid weekly or more frequently
7	Unskilled manual workers paid weekly or more frequently
8	Farmers
9	Agricultural workers

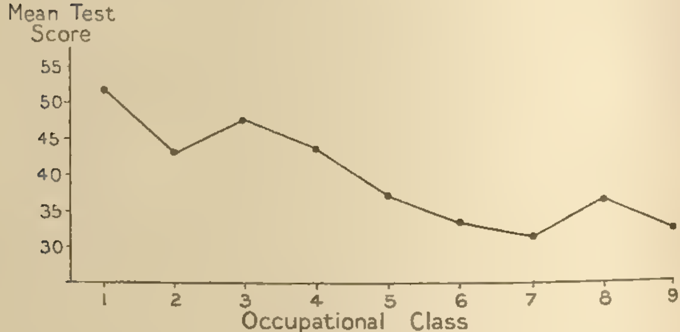

FIGURE 34*a* Mean Test Score by Occupational Class

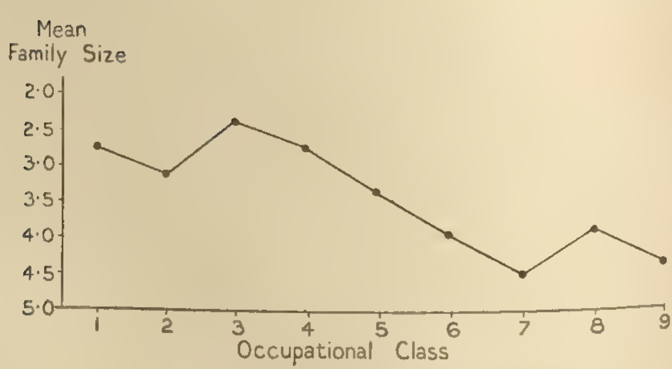

FIGURE 34*b* Mean Size of Family by Occupational Class

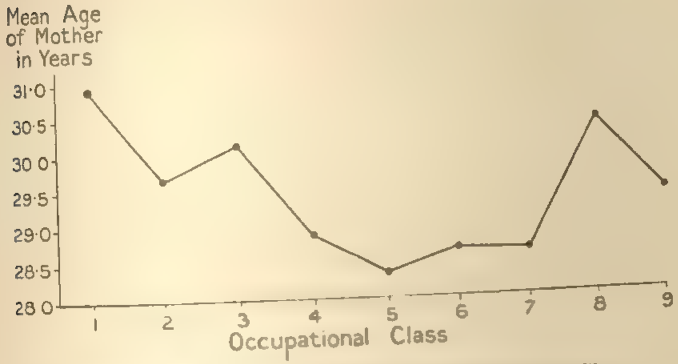

FIGURE 34c Mean Age of Mother by Occupational Class

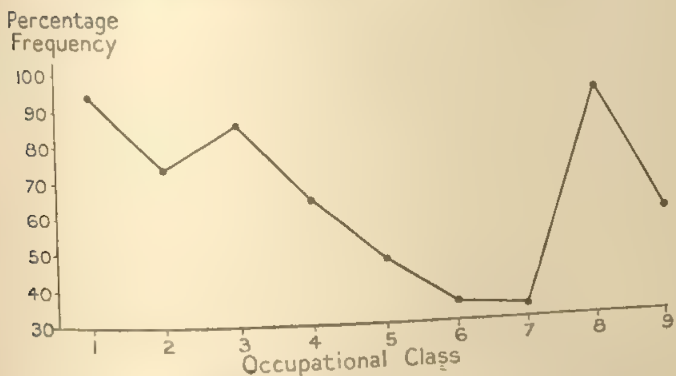

FIGURE 34d Percentage of Children Living in Homes with Fewer than Two Persons per Room, by Occupational Class

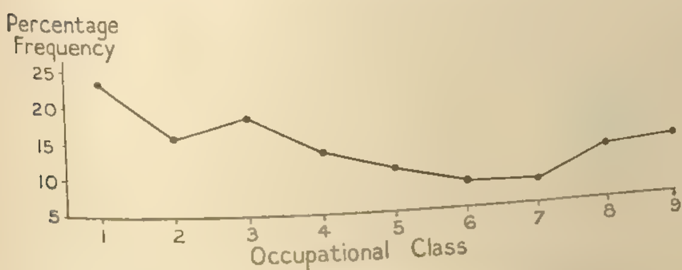

FIGURE 34e Percentage of Migrants by Occupational Class

FIGURE 34*f* Mean Height by Occupational Class

FIGURE 34*g* Mean Weight by Occupational Class

The children from occupational class 1, the professional and large employer group, and from class 3, the salaried employees, differ almost invariably from the other groups in having higher average intelligence test scores, in belonging to smaller families, in living in better housing conditions, in having greater mobility and better physique. The reverse holds for the children from certain other groups, particularly from class 7, the unskilled manual workers.

Differences in occupational class have far-reaching influences, as occupational class involves much more than just the occupation followed by the father. There are differences in the

average level of intellectual ability required for different occupations. In the professions and the skilled trades, for example, a certain minimum level of ability is required to obtain the necessary initial qualification, and to maintain the standard of work expected. It does not follow, of course, that there are no intelligent men among the unskilled and unqualified workers; there are, but there is not the same lower limit of selection. Marriage also is not unselective in regard to intelligence; there is a tendency for the wife's intelligence to be correlated positively with that of the husband.[1]

There are also differences in income between the occupational groups. In general, a skilled workman will earn more than an unskilled one, and a professionally-qualified man more than an unqualified man. But the significant difference is not so much in the amount of money earned as in the ways it is spent. A skilled tradesman may earn as much as a professional man, but in certain occupational classes the possession of a car, suitable clothing, a good address, and participation in social and cultural activities are regarded as of more importance than they are in other groups. The result is that the interests and the values of children from different occupational classes are not entirely identical.

There are also differences between the occupational classes in family structure. The average size of family varies from one occupational class to another, the groups in which the children have the highest average intelligence tending to be those with the smaller families. These differences in family size are probably the result of a number of trends. Often the parents are faced with a choice between maintaining a certain material and social standard of living on the one hand, and having a large number of children on the other hand. The parents' choice is partly determined by the values and standards of the occupational group to which they belong. Marriages also tend to occur later in certain occupational groups than in others, the result probably of both social convention and the longer period required, in the professions for example, to attain the desired level of income considered necessary for marriage.

[1] L S Penrose, *British Journal of Psychology*, General Section, vol XL, pt 3, March 1950, p 130

Later marriage means less likelihood of a large family. The limitation of family size by the use of birth control is still apparently not equally prevalent in all occupational classes. During the present century the practice of birth control has spread from certain groups, of whom the professional group may be considered typical, to the other groups, of whom the unskilled workers may be considered typical. In the first group the process appears to have reached its limit, but there is evidence from mothers in the other group that birth control is not so extensively practised, though it is becoming relatively more frequent among the younger mothers, and is being used somewhat earlier in their married lives. It is possible, therefore, to discern graded differences between the occupational classes in both family structure and age at marriage. Throughout, we must keep in mind the differences in home environment between the child of older parents and with few brothers and sisters and the child in a larger family whose parents married earlier in life.

These differences in ability, income, and family structure are probably only reflections of more fundamental but less ponderable differences in social attitudes and values. The different attitudes of the parents to social standing, to the education and future prospects of the family, and to cultural and social activities must make a difference in the child's way of living. Our purpose here is not to differentiate between what is good or bad in the standards and attitudes of the various occupational groups; it is merely to emphasise that these differences exist both on the material and cultural plane, and that some children enjoy the benefits of being brought up as one of a small family in a relatively spacious home by parents interested in education and culture, while other children, brought up in a poorer home as part of a large family, may yet be receiving benefits which the other children lack.

OCCUPATIONAL CLASS AND FAMILY STRUCTURE

After these general considerations of the nature of occupational class, let us examine the data of the thirty-six-day sample to see how far they reflect and clarify the differences we have been discussing. The complete data for occupational class and

family structure are given in appendix table 35. The main findings are given in table LX and figure 35.

TABLE LX

FAMILY SIZE AND MOTHER'S AGE BY OCCUPATIONAL CLASS

	Occupational Class									
	1	2	3	4	5	6	7	8	9	*All*
Mean Family Size	2·6	3·1	2·5	3·1	3·6	4·3	4·6	3·9	4·3	3·77
Mean Age of Mother	30·9	29·6	30·1	28·9	28·3	28·7	28·6	30·4	29·4	28·8
Percentage of Mothers										
(*a*) Over 36 years old	13·7	11·7	10·8	11·4	9·5	12·9	13·8	15·0	16·4	11·8
(*b*) Under 22 years old	2·7	5·1	2·8	8·1	9·6	11·0	13·8	5·3	10·4	10·0

Data concerning mother's age must be interpreted with caution, even though the discussion is confined to mothers of eleven-year-old children. If all other things were equal, the relation between mother's age and size of family would be a function of duration of marriage. The older mothers would tend to have the larger families. For the survey data, however, all other things are not equal.

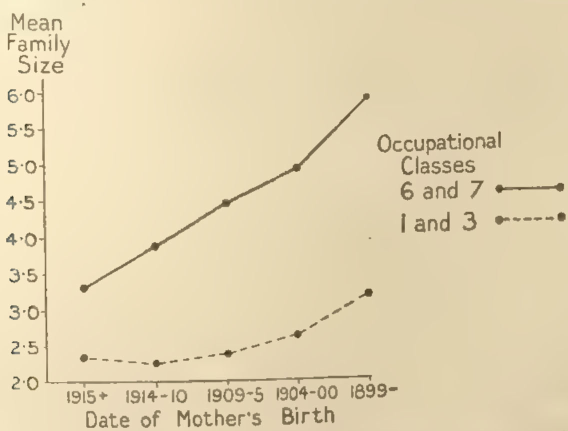

FIGURE 35 Mean Size of Family for Date of Mother's Birth: Occupational Classes 1 and 3, and 6 and 7

Firstly, we are dealing with a selected group of mothers; only those mothers with an eleven-year-old child appear in the survey. The older mothers thus tend to be those who have had large families, or those who have borne smaller families

late in the reproductive period of their married life. Similarly, the younger mothers will be those who have married early, and commenced child-bearing soon after marriage. Each mother appears only once in the survey, so that when we compare older and younger mothers we are comparing women of different generations. There may have been changes in marriage habits and family structure over the fifteen years which separate the older from the younger mothers, but, owing to the selection by fertility, we cannot assess the effect of these changes.

Secondly, there are differences in the mother's ages and family sizes for the various occupational classes. The classes in which the mothers are older are those in which the families tend to be smallest. Figure 41 shows the increase in average family size by age of mother for occupational classes 1 and 3, and for classes 6 and 7, these two pairs of occupational classes being the most divergent in respect of mother's age and family size. Not only do the mothers in classes 1 and 3 tend to be older and to have smaller families, but the rate of increase of family size with age of mother is considerably less rapid for these two occupational classes than it is for classes 6 and 7. The reduction in the fertility of such occupational classes as 1 and 3 has come about primarily through the compression of the effective reproductive period. The mothers in classes 1 and 3 who marry early do not appear to continue to bear children throughout their whole reproductive married life; those who marry later, as many do, do not have the opportunity to have large families. The average family size of mothers in these classes is relatively small, so that there is a less marked correspondence between family size and age of mother than in occupational classes 6 and 7, where the mothers appear not only to marry earlier, but to bear children over a longer period of their married lives.

The data available from the survey are not sufficient to allow any definite inferences to be drawn about the relationship of occupational class with marriage habits and family structure. But the data are consistent with the findings of other investigations, such as those undertaken by the Royal Commission on Population.[1] Considering the situation as it affects our eleven-year-old children, we do find that the children from the differ-

[1] See ch V, pp 101-2

ent occupational classes are brought up in rather different family surroundings. Children of professional men, large employers, and salaried employees tend to be members of families in which they have comparatively few brothers and sisters, generally only one or two, and in which their parents tend to be somewhat older than average; also, the number of their brothers and sisters is not constantly increasing. At the other end of the scale, the children of unskilled workers are likely to be members of fairly large families. If the mother is young, as she may well be, the family to which the child belongs tends to be regularly increasing. If the mother is older, as she again may well be, the children tend to find themselves the younger members of a large family, their older brothers and sisters having either left home or still remaining and probably contributing to the family income. Little imagination is required to realise that the children from these different occupational groups will have a rather different kind of home life.

CHILDREN NOT LIVING WITH THEIR OWN MOTHER

Another aspect of the family conditions in which the children live is that of broken families, where the child is not living with his or her own mother. The reasons for the separation were not required in the sociological schedules; there is little doubt but that in the majority of cases it was the death of the child's natural mother. Of the thirty-six-day-sample children, 544, or 7·4 per cent, are recorded as not living with their own mother. Appendix table 45 gives an analysis of the distribution of these deprived children according to family size and occupational class. In table LXI below we give further data about the family and social conditions of these children.

The main difference between the children not living with their own mothers and those living within the normal family structure is in test score. There is a difference of about three and a half points of score between the two groups of children. This difference is probably the result of influences which are not revealed in the survey data. There does not appear to be any marked distinction between the deprived children and the others in occupational class. Though there is a greater proportion of deprived children in the classes of unskilled and agri-

cultural workers, the difference is a small one.[1] As the major reason for the separation is probably the death of the mother,

TABLE LXI

CHILDREN NOT LIVING WITH THEIR OWN MOTHER

(a) Test Score

	n	*Mean*	*Standard Deviation*
Deprived Children	507	33·07	16·28
All Thirty-six-day Sample	6857	36·66	16·13

(b) Size of Family

	1	2	3	4	5	6	7	8	9	10 +	*Mean*
Deprived Children	138	108	90	87	35	41	11	11	7	6	3·53
All Thirty-six-day Sample	756	1529	1437	1095	723	469	319	216	117	149	3·77
Deprived Children as Percentage of All Thirty-six-day Sample	18·2	7·1	6·3	7·9	4·8	8·7	3·4	5·1	6·0	4·0	

(c) Age of Mother

	21 –	22-26	27-31	32-36	37 +	*Mean*
Deprived Children	91	133	88	59	42	26·9
All Thirty-six-day Sample	706	2082	1939	1499	830	28·8
Deprived as Percentage of All Thirty-six-day Sample	12·7	6·4	4·5	3·9	5·1	

(d) Occupational Class

	1	2	3	4	5	6	7	8	9
Deprived Children	17	24	12	30	140	95	111	17	50
All Thirty-six-day Sample	238	343	256	591	2559	1288	1236	145	473
Deprived as Percentage of All Thirty-six-day Sample	7·1	7·0	4·7	5·1	5·5	7·4	9·0	11·7	10·6

it is not surprising to find that the average age of the mother for the deprived children is lower. Of all the children with mothers aged twenty-one or less, 13 per cent are recorded as

[1] It is not possible to tell whether the occupation recorded is that of the child's natural father or that of the present guardian. Of the 544 children not living with their own mothers, at least twenty-six are known to be boarded out by local authorities in foster homes, and for these the occupation given is that of the foster father. Most of the foster fathers are farmers, agricultural workers or unskilled workers, and nearly all the foster homes are in rural areas. It is probable that the greater proportion of children from occupational classes 7, 8 and 9 is due to the greater frequency of these occupations among foster fathers than among the natural fathers of the children. For most of the deprived children the occupation is most likely to be that of the natural father.

not living with their own mother as compared with 7·4 per cent for all ages of mother. It should also be stated that for about a quarter of the deprived children the age of mother was not known. In the same way, we find that the average family size of the deprived children is smaller, but only slightly smaller, than that for all the thirty-six-day-sample children. This difference in average family size appears to be the result of the preponderance of only children among those not living with their own mother. About a fifth of these children are only children, compared with about a tenth of all the thirty-six-day-sample children. As the survey data do not record either the cause of the separation, or with whom the children are now living, it is impossible to discuss adequately the social implications of these differences. We can only observe that these deprived children appear to be distributed fairly uniformly among the different occupational classes, and that the main point of difference between them and the other children is in the intelligence test score.

OCCUPANCY RATE

Occupancy rate is taken here as a general index of housing conditions, and we shall regard as overcrowded those homes in which there are two or more persons per room. According to the scheme of classification used in the survey, homes with an occupancy rate coded as 3 and 4 are overcrowded.

Persons per Room	*Code Number*
Fewer than one - - -	1
One and fewer than two -	2
Two and fewer than three -	3
Three and more than three -	4

Thinking in terms stated above, we should expect that the children who are members of the largest families would tend to be found in the homes with the higher occupancy rates. This is in part true, but examination of tables LXII and LXIII leads to the conclusion that differences in occupational class are even more closely related to occupancy rate than are differences in family size (see appendix table 36).

For the group of least crowded homes, those with occupancy rate 1, there is a greater range of variation for occupational

class than there is for family size. The same applies in a less degree to homes with occupancy rates 3 and 4. In general, there is a wider range of occupancy rates by occupational class

TABLE LXII

PERCENTAGE DISTRIBUTION OF OCCUPANCY RATE BY FAMILY SIZE FOR ALL OCCUPATIONAL CLASSES

	Occupancy Rate					
Family Size	1	2	3	4	*Unknown*	*Total*
1	23·3	61·7	7·4	6·2	1·3	99·9
2	13·7	47·4	30·2	7·6	1·1	100·0
3	7·4	50·3	32·2	8·5	1·6	100·0
4	3·6	36·2	29·4	30·0	0·8	100·0
5	2·6	33·4	34·4	29·0	0·6	100·0
6 +	1·2	20·9	43·0	33·3	1·1	100·0
Unknown	5·8	30·8	36·5	17·3	9·6	100·0
All	8·3	41·2	30·9	18·5	1·2	100·1

TABLE LXIII

PERCENTAGE DISTRIBUTION OF OCCUPANCY RATE BY OCCUPATIONAL CLASS FOR ALL SIZES OF FAMILY

Occupational	Occupancy Rate					
Class	1	2	3	4	*Unknown*	*Total*
1	63·2	31·8	3·3	0·4	1·3	100·0
2	21·6	51·1	18·4	8·0	0·9	100·0
3	32·0	53·9	13·3	0·4	0·4	100·0
4	11·1	54·4	25·9	7·9	0·7	100·0
5	3·8	42·8	34·1	19·0	0·3	100·0
6	0·9	33·6	38·3	26·4	0·7	99·9
7	1·4	31·1	37·1	29·6	0·7	99·9
8	37·7	53·4	8·2	0·7	—	100·0
9	7·9	50·9	27·8	12·7	0·6	99·9
Unknown	7·3	38·0	19·0	12·7	22·9	99·9
All	8·3	41·2	30·9	18·5	1·2	100·1

than by family size. A relationship between family size and occupational class exists, but even allowing for this, the strong relationship between occupational class and housing conditions prevails. Table LXIV gives an analysis of this threefold relationship in a compact form.

The most striking feature of these results is the number of Scottish children who are living in overcrowded homes. Almost exactly half of the eleven-year-old children live in homes con-

taining two or more persons per room. That this degree of overcrowding cannot have a beneficial effect on the children's development needs no emphasis. Though it is true for all occupational classes that the occupancy rate increases with size of family, the distinction between the occupational groups in respect of housing conditions is still very definite. Of the children of non-manual workers, 13·5 per cent of those from small families live in overcrowded homes, as compared with 37·9 per cent of the children of manual workers with small families. The corresponding proportions for families of medium

TABLE LXIV

PERCENTAGE DISTRIBUTION OF OCCUPANCY RATE BY OCCUPATIONAL CLASS AND FAMILY SIZE

Occupancy Rate	*Non-manual Workers Size of Family* Small	Medium	Large	All	*Manual Workers Size of Family* Small	Medium	Large	All	*Grand Total*
1	38·2	19·5	7·6	26·8	6·3	4·4	0·9	3·8	8·8
2	48·3	55·4	48·3	50·8	55·8	40·4	22·4	38·6	41·3
3	12·2	19·7	28·4	17·4	28·2	34·1	41·9	35·1	31·2
4	1·3	5·4	15·7	5·0	9·7	21·1	34·8	22·5	18·7
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

Note (*a*) Families of one and two children are defined as small, families of three and four children as medium, and the remainder as large

(*b*) The manual workers consist of occupational classes 5, 6, 7 and 9. The remainder are classified as non-manual

size is 25·1 per cent for children of non-manual workers and 55·2 per cent for children of manual workers; for the large families the proportions are 44·1 for the non-manual group and 76·7 for the manual group.

For all sizes of family the incidence of overcrowding ranges from about four per cent for the children from occupational class 1 to about sixty-seven per cent for children from occupational class 7. The difference in the housing conditions of the children from these two occupational groups is very striking, and very disturbing. In fact, the general picture presented of the housing conditions of our eleven-year-old Scottish children is disquieting. Too many children are living in homes which by modern standards are overcrowded. But the marked distinction between the housing conditions of children in such

occupational classes as 1 and 7 lends further support to the belief that parents from the professional and allied classes tend to relate the size of their families and the facilities they can provide for their children to a greater extent than do parents from the occupational classes at the other end of the scale.

LOCATION OF HOME

We have so far been discussing the social conditions of the survey children for Scotland as a whole. But it is possible to classify the children further in respect of the kind of area in which their homes are situated. There are four categories of area, which we have coded as 1, 2, 3 and 4. The four cities, Aberdeen, Dundee, Edinburgh and Glasgow are coded as 1. All these are well over the 100,000 level in total population. The large towns have been coded as 2; these are the eighteen towns whose population exceeded 20,000 at the 1931 Census of Scotland, the latest census previous to the survey. Code number 3 has been given to the small towns, which comprise the burghs which at the 1931 census had populations less than 20,000, but more than 10,000. In 1931 there were nineteen such small towns. The rest of Scotland is termed the Other Areas, and is coded as 4. The classification by kind of area is, therefore, as follows:

1 Cities
2 Large towns
3 Small towns
4 Other areas

Though the classification was based on a census sixteen years old at the time of the survey, little radical change in the distribution of population in these sixteen years seems to have occurred. On the basis of the latest information, that provided by the *Preliminary Report of the Fifteenth Census of Scotland*, 1951, the survey classification would have required alteration in a few instances only. Two additional large towns appear in the 1951 census, the burghs of Buckhaven and Methil and of Port Glasgow, which were small towns in the 1931 census figures. To the small towns we should need to add in 1951 Prestwick, Elgin, Fraserburgh, Rothesay and Troon, and to remove from the list Port Glasgow, Buckhaven and Methil,

now large towns, and Bo'ness, which in 1951 failed to reach the required population of 10,000 by only fifty-one persons. It appears, therefore, that the 1931 classification is not substantially different from a similar classification based on the 1951 census figures.

It should be noted that the survey classification of cities, large towns, small towns, and Other Areas does not coincide exactly with the census classification of cities, large burghs, small burghs, and landward areas. The cities are the same for both census and survey, and the large towns and large burghs virtually the same, but the number of small burghs is much greater than the number of small towns, so that many of the

TABLE LXV

DISTRIBUTION OF THIRTY-SIX-DAY SAMPLE AND ALL SURVEY BY LOCATION OF HOME

	Thirty-six-day Sample		*All Survey*
Location of Home	*n*	*Percentage*	*Percentage*
1	2895	39·2	38·2
2	1151	15·6	15·4
3	427	5·8	5·5
4	2907	39·4	40·9
All	7380	100·0	100·0

census small burghs are included, together with the landward areas, in the Other Areas of the survey. It follows, therefore, that the Other Areas of the survey include districts which are not necessarily rural in character. The Other Areas include, for instance, housing and industrial estates on the outskirts of the cities, of Glasgow in particular, mining districts in Fife, the Lothians, Lanarkshire and elsewhere, as well as areas which may properly be termed rural. A more detailed classification would indeed have been desirable, but the various districts of Scotland are so diverse in their size and nature that it does not appear possible to devise any classification that would do justice to all their characteristics, and which, at the same time, would be sufficiently simple to administer in such a survey as the present one.

The distribution according to area of the homes of the

thirty-six-day-sample children, with whom we are dealing throughout this chapter, is given in table LXV. The distribution of the children is very close to that of the whole population of Scotland for the year 1947. The cities and Other Areas clearly contain most of the survey sample, and between them account for about eighty per cent of both populations.

LOCATION OF HOME, GROUP-TEST SCORE, AND FAMILY SIZE

Fears have frequently been expressed that the rural areas are being denuded of the best elements in their population, due to the attraction of the cities for the more intelligent. The implication is that the average intelligence of the city children is increasing at the expense of the rest of the country. The migration of children from one kind of area to another will be discussed in a later section of this chapter; but the survey evidence does not show any marked differences between the average test score of children living in the different areas (see appendix table 38). The mean test scores of the children living in the four different areas are as follows:

	Cities	*Large Towns*	*Small Towns*	*Other Areas*	*All*
Mean Test Score	37·43	36·73	37·18	35·80	37·66

The greatest difference of mean score, that of 1·63 points between children in cities and Other Areas, is statistically significant, but small. It is less than the difference of 1·74 points between boys and girls over the whole country. Though the survey results for migration within the country may raise some doubts, the figures for mean test score for the different locations of home need give no cause for alarm about any lack of balance in the level of intelligence of children living in the different types of area.

Nor are there any marked differences in the average family size for the four different areas (appendix table 37). The average size of the families to which the children belong is as follows:

	Cities	*Large Towns*	*Small Towns*	*Other Areas*	*All*
Average Family Size	3·59	3·83	3·82	3·91	3·77

The general trend is similar to that for test score, the city

children belonging to families which are, on the average, slightly smaller than those of children living in the Other Areas. But once again the differences between the areas are small.

LOCATION OF HOME AND SOCIAL CONDITIONS

Distinctions have frequently been drawn between the living conditions of children in the different types of area, sometimes in favour of one type of area, at other times in favour of another. Table LXVI gives the survey data for housing conditions of children living in the different areas (appendix table 43).

TABLE LXVI

PERCENTAGE DISTRIBUTION OF OCCUPANCY RATE BY LOCATION OF HOME

Occupancy Rate	*Location of Home* 1	2	3	4	*All*
1	6·6 (188)*	6·6 (75)	5·9 (25)	11·1 (318)	8·3 (606)
2	38·4(1094)	39·5 (452)	43·0 (181)	45·6(1311)	41·7(3038)
3	31·8 (907)	37·3 (427)	33·3 (140)	28·1 (806)	31·3(2280)
4	23·2 (663)	16·6 (190)	17·8 (75)	15·2 (437)	18·7(1365)
Total	100·0(2852)	100·0(1144)	100·0 (421)	100·0(2872)	100·0(7289)

*The figures in brackets give the numbers of children from which the percentages are derived

The results in table LXVI are summarised in table LXVII.

TABLE LXVII

OCCUPANCY RATE BY LOCATION OF HOME

Location of Home	*Mean Occupancy Rate*	*Percentage of Children in Homes with* (*a*) *Fewer than Two Persons per Room*	(*b*) *Two or More Persons per Room*
1	2·65	45·0	55·0
2	2·64	46·1	53·9
3	2·63	48·9	51·1
4	2·47	56·7	43·3
All	2·60	49·0	51·0

We have already commented on the general level of housing conditions throughout the country. Table LXVI indicates that housing conditions are somewhat better in the Other Areas than in the more urban localities, and are worst of all in the cities, where somewhat more than half of the children are living in homes which can fairly be described as overcrowded. The inci-

dence of bad overcrowding (three or more persons per room) is also worst in the cities, where 23·2 per cent, or nearly a quarter, of the children live in such conditions, as compared with 15·2 per cent of the children from Other Areas. There is not much difference between the housing conditions of children living in the cities, large towns, and small towns, but it does appear as if the children in urban areas tended to live in more crowded homes than children living elsewhere in Scotland.

It is in occupancy rate that the most marked distinction between the different types of area occurs. The distribution of children in the four types of area according to occupational class is given in table LXVIII (appendix table 37) and figure 36. Occupational classes 8 and 9, the farmers and agricultural workers, have been omitted, as the nature of their calling virtually restricts them to Other Areas.

There is comparatively little variation in the proportions of the different occupational classes in the large and small towns; the most marked variation in incidence occurs in the cities and the Other Areas. Children from class 4 (the non-manual workers), from class 7 (the unskilled manual workers), and from class 3 (the salaried employees) are relatively more frequent in the cities. Conversely, children from class 2 (self-employed and small employers), class 6 (semi-skilled manual workers), and class 1 (the professional men and large employers) are more frequently found to be living in the Other Areas. These differences in the incidence of occupational class are probably the result of social and economic factors. The cities tend to be the centres of both commercial and administrative activity, hence the relative frequency of non-manual workers and salaried employees. Unskilled manual labour is more likely to be used in a large factory than in a small one. In the Other Areas business concerns tend to be on a smaller scale, with less demand for either highly skilled or unskilled manual labour. The presence in the Other Areas of children from class 1 is most likely due to the fact that the majority of the parents in this group are professionally-qualified men, and to a large extent engaged in such social services as education and medicine; the distribution of such social services is very closely linked to the distribution of the population as a whole.

It does not appear to be possible to make any clear-cut distinction between children in the cities and in the Other Areas in occupational class. The occupational classes which appear to provide the best opportunities and conditions for their

TABLE LXVIII

PERCENTAGE DISTRIBUTION OF LOCATION OF HOME BY OCCUPATIONAL CLASS

Location of Home	*Occupational Class* 1	2	3	4	5	6	7	*All**
1	41·6	32·9	45·9	53·1	42·2	34·8	48·5	42·6
2	12·6	14·5	15·7	17·2	17·0	18·0	17·5	17·0
3	5·9	5·2	4·3	5·4	7·2	7·2	4·8	6·3
4	39·9	47·4	34·1	24·4	33·6	39·9	29·1	34·2
Total	100·0	100·0	100·0	100·1	100·0	99·9	99·9	100·0
Number of Pupils	238	346	255	594	2566	1300	1243	6542

*Excluding classes 8 and 9

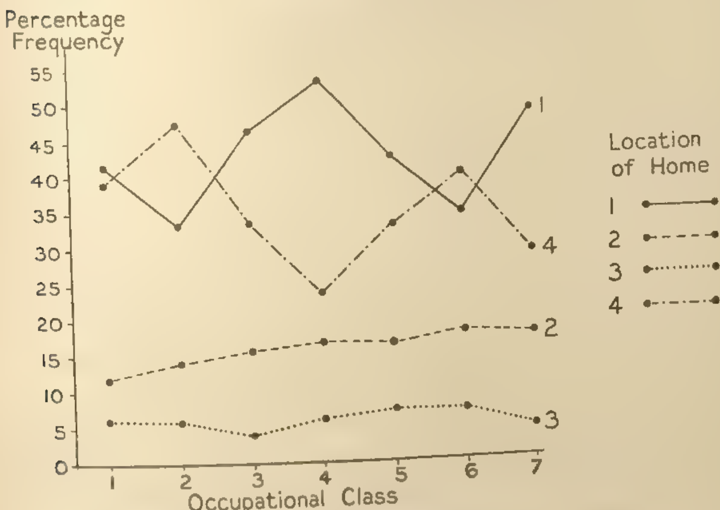

FIGURE 36 Percentage Distribution of Location of Home by Occupational Class

children appear in both cities and Other Areas, and, as far as our data go, there is no ground for making any distinction between city children and children from Other Areas in family and social conditions resulting from differences in occupational class.

MIGRATION

The term 'migration' is here used in a specific sense, since the data do not take into account changes in geographical location within each category of location of home. Thus a child born in Aberdeen but now living in Glasgow would not be classed as a migrant, inasmuch as he has not migrated from a city to a large town, small town, or Other Area. The survey figures for migration are therefore an underestimate of the amount of movement that has taken place within the country. Migrants are defined as those children who were born in one of the four types of area and who were at the time of the survey living in another type of area. Our data on migration are therefore based on the information recorded in the sociological schedules as to the location of the child's birthplace (city, large town, small town, or Other Area) and the location of his home at the time of the survey. There is another source of information about migration. The schedule asks whether the child is living in or near his or her birthplace. The interpretation of the phrase 'in or near' gave rise to considerable difficulty and some inconsistency, and though a very detailed set of coding instructions[1] was prepared to obviate these inconsistencies, the instructions appear to have been too elaborate to administer with complete accuracy. Though this latter source of information should have given a more comprehensive picture of the amount of internal migration in Scotland, we have not complete confidence in the accuracy of this set of data. We have presented the main analysis in appendix table 44. We shall, however, base subsequent discussion of migration on comparison between location of birthplace and location of home; although these data are more limited, they are certainly more accurate.

The percentage distribution of the children according to birthplace and place of home in 1947 is given in table LXIX.

About 88·5 per cent of the children have their homes in the same type of area as they were born in. The remaining 11·5 per cent are the migrants. The amount of migration is not the same for each area. The children born in the small towns

[1] Appendix to ch III, p 64

migrate to a greater extent than the children born in any other locality. About twenty per cent of the children born in small towns are no longer living there; most of them have gone to the Other Areas. The least migration occurs for children born in the cities; only about nine per cent of them migrate. The general direction of migration is into the Other Areas, more migrants going to the Other Areas than elsewhere. For the

TABLE LXIX

PERCENTAGE DISTRIBUTION OF LOCATION OF HOME FOR LOCATION OF BIRTHPLACE

Location of Birthplace	*Location of Home* 1	2	3	4	*Total*
1	90·9(2657)*	1·8 (53)	0·7 (22)	6·6 (193)	100·0(2925)
2	3·7 (39)	83·1 (908)	2·2 (24)	11·0 (120)	100·0(1091)
3	2·7 (10)	1·3 (5)	79·6 (301)	16·4 (62)	100·0 (378)
4	3·6 (89)	4·5 (113)	1·9 (46)	90·0(2271)	100·0(2519)
All	40·5(2795)	15·6(1079)	5·7 (393)	38·2(2646)	100·0(6913)

*The figures in brackets give the numbers of children from which the percentages are derived

children born in the Other Areas, the main flow of migration is to the cities and large towns; but on the balance there are more children living in the Other Areas than were born there, and fewer children living in the cities than were born there. This movement applies only to the first eleven years of the child's life; it may be reversed at a later age. And our data only apply to the eleven years between 1936 and 1947, which may not be a typical period. But as far as they go, the survey data do not support the view that the population of the cities is increasing at the expense of the rest of the country.[1]

[1] The distributions of the population of Scotland in 1931 and 1951, according to the Scottish Mental Survey classification of types of area, are given below:

	(1) 1931 *Census*	(2) 1951 *Census*	(3) *Expected* 1951	(4) (2) – (3)
Cities	1,879,329	1,916,372	1,977,502	–61,130
Large Towns	733,470	786,979	771,785	+15,194
Small Towns	259,255	282,551	272,798	+9,753
Other Areas	1,970,926	2,110,067	2,073,284	+36,183
Total	4,842,980	5,095,969	5,095,969	

Column 3 gives the population of Scotland in 1951 as it would have been had the proportionate distribution over the four types of area remained the same as it was in 1931 (from *Preliminary Report of the Fifteenth Census of Scotland*). See note on p 192 about migration

MIGRATION AND OCCUPATIONAL CLASS

There are distinct differences between the children from the different occupational classes in the amount of migration. Table LXX gives the percentage of migrants in each occupational class (see figure 34*e*). The complete data are given in appendix table 42.

TABLE LXX

PERCENTAGE OF MIGRANTS IN EACH OCCUPATIONAL CLASS

Occupational Class								
1	2	3	4	5	6	7	8	9
23·3	15·8	18·2	14·2	10·6	9·1	8·4	12·8	13·1

The relationship between occupational class and amount of migration is very similar to that between occupational class and average test score and family size. The classes in which the children have the highest average test scores and the smallest families are also those in which the greatest proportion of migration occurs. Children of professional men, for example, have migrated to a much greater extent than the children of unskilled manual workers. It is probable that the greater mobility of certain of these classes is linked with family size; it is easier to move a small family than a large one. But it is also likely that this increased mobility may be connected with different social aims and ambitions. The occupational classes which are most mobile are probably those in which the prospects of advancement in the father's occupation are greater, and those in which this advancement is of importance to the parents, not only for themselves but for the well-being of their children. What effect this migration has upon the lives of the children it is not possible to assess, but to the differences between children from the various occupational classes we must now add that almost one in four of the children from occupational class 1 have changed their place of residence at least once in their lives, as compared with about one in twelve from class 7.

MIGRATION, TEST SCORE AND FAMILY SIZE

We have already noted that the occupational classes in which there is the largest proportion of migrants are those characterised by the higher average test score of the children. It is not

unexpected, therefore, that the average test score of the migrants is higher than that of the children who have not migrated. Table LXXI, derived from appendix table 38, gives the mean test scores for all the children and for the migrants. [1]

TABLE LXXI

MEAN TEST SCORES AND MIGRATION

	Cities	*Large Towns*	*Small Towns*	*Other Areas*	*All*
All born in:	37·2	36·2	36·3	35·7	36·4
All living in:	37·4	36·6	37·4	35·3	36·4
Migrated from:	37·5	36·7	34·4	39·8	37·7
Migrated to:	41·9	38·8	39·3	35·2	37·7

Except for the small towns, the differences between the average test scores of children born in, and children now living in, any given locality are not very great. But there are differences between the migrant children and the others, the average test score of the migrants being 1·3 points higher than that of all the children. The difference in average score between the children born in the cities and the children now living in the cities is very small, 0·2 points. But the average score of city-born children migrating to Other Areas is 36·1 points, as compared with the average score of 43·2 for children born in Other Areas who have migrated to the cities (appendix table 38). Here the difference is considerable, indicating a marked tendency for the less intelligent city children to migrate to the Other Areas, and the more intelligent children from the Other Areas to migrate to the cities. It is not likely that the difference is due to any superiority of the educational or cultural opportunities in the cities being reflected in test score. If the large towns and small towns are included in the analysis, the trends become more complex; but on the data available there does appear a distinct tendency for the children migrating from the Other Areas to be of higher than average intelligence, and the children migrating to the Other Areas to be of lower than average intelligence. If this process has been going on for any considerable number of years, we should expect the difference between children born in Other Areas and children born elsewhere to be somewhat greater than in fact it appears to be. The

[1] See note on p 192

data available are too scanty to derive any general conclusions from, but it may well be that when more extensive information becomes available we shall be faced with a paradox similar to that of the relation of family size and intelligence, where the lower average intelligence of the children in larger families does not appear to have resulted in a lowering of the average intelligence of the population.

The average family size of the migrants is smaller than that of all the children, being 3·37 as compared with 3·77. Table LXXII, derived from appendix table 41, gives the data for family size in the same form as for test score.

TABLE LXXII

MEAN FAMILY SIZE AND MIGRATION

	Cities	*Large Towns*	*Small Towns*	*Other Areas*	*All*
All born in:	3·57	3·84	3·77	3·96	3·77
All living in:	3·59	3·83	3·82	3·91	3·77
Migrated from:	3·16	3·43	3·53	3·50	3·37
Migrated to:	3·13	3·36	3·79	3·36	3·37

The trends here are not so clear. The average family size of city children is smaller than that of children in other types of area, and the average family size of the migrant children is smaller than average. But we cannot trace the same currents of migration in family size as we can with test score. A similar situation prevails for occupancy rate, the data for which are given in appendix table 43.

We should at this point draw attention to a feature of the data on migration which has not been present in the survey data we have previously been discussing. The number of children whose location of home is known is larger than those whose birthplace is known. There are 467 children, out of 7,380, whose birthplace is unknown. In the analyses of the other survey data which we have conducted, the children for whom any given item of information was not recorded appeared, on all the evidence available, to be randomly selected groups. Those whose birthplace is unknown appear to constitute a rather superior group. The average test score of this group is 39·9 points, the average for the whole thirty-six-day sample

being 37·7 points. Similarly, their average family size is 3·40, as compared with 3·74 for the whole sample. The distribution by occupational class follows similar lines, 15·1 per cent of class 1, 13·7 per cent of class 3, and only 4·1 per cent of class 7 having their birthplace unknown. In analysing the data for migration we have of necessity had to omit these children. The reason for the bias of this group with unrecorded birthplaces is not clear, but in all their characteristics they resemble the migrant children much more closely than the non-migrant children. It is more probable than not that a child whose birthplace was not known or not recorded has migrated. It is unlikely that this apparent bias in selection invalidates in any way the general findings from the data on migration.

MIGRATION, HEIGHT AND WEIGHT

Tables LXXIII and LXXIV give the average heights and weights of the children according to location and migration (appendix tables 39 and 40).

TABLE LXXIII

MEAN HEIGHT IN INCHES AND MIGRATION

	Cities	*Large Towns*	*Small Towns*	*Other Areas*	*All*
All born in:	53·81	54·11	54·19	54·36	54·08
All living in:	53·81	54·04	54·17	54·37	54·08
Migrated from:	54·31	54·46	54·54	54·38	54·39
Migrated to:	54·67	54·05	54·35	54·44	54·39

TABLE LXXIV

MEAN WEIGHT IN POUNDS AND MIGRATION

	Cities	*Large Towns*	*Small Towns*	*Other Areas*	*All*
All born in:	68·53	68·89	69·57	71·17	69·60
All living in:	68·49	68·69	68·73	71·18	69·60
Migrated from:	70·41	69·50	73·29	69·57	70·22
Migrated to:	71·27	68·27	69·14	70·15	70·22

The city children are clearly inferior in both height and weight to the children in the Other Areas. And once again the migrants are a somewhat superior group, being above average in both height and weight. The pattern for height and weight

is not quite the same as for test score. Comparing the cities with the Other Areas, we find that the children migrating from the cities to the Other Areas are superior in physique to all the city-born children, and the children migrating from the Other Areas to the cities are also superior to the city-born children. For intelligence test score, the flow of the more intelligent children was from the Other Areas to the cities, but for height and weight the flow is in the opposite direction. It is improbable that the better physique of the migrant children is due to an innate physical superiority; it is more likely that residence in the Other Areas would have a stimulating effect on the physical development of children than that residence in a city would have a corresponding effect on the intellectual development. It is possible that the migrants from the cities to the Other Areas were not necessarily a physically superior group initially; living in Other Areas for a number of years may have made them so. And as we do not know the length of time these migrants have been living either in the cities or the Other Areas, we cannot assess the original differences in the physical constitution of the children in either group of migrants. The only certain conclusion that can be drawn is that the migrants are, once again, a superior group.

MIGRATION—CONCLUSIONS

At least one in ten of the survey children has migrated from one kind of locality to another before reaching the age of eleven. If we extend the definition of migration to include movement within the different types of area, the proportion would be nearer to one in six. These migrants do not appear to be a random selection from the population. There are certain factors which seem to influence migration; the socio-economic status of the child's parents appears to be the main one. Migration appears to be much more frequent among the children from families of higher socio-economic status. About a quarter of the children of fathers who are either professional men or large employers have migrated, but only about eight per cent of the children of unskilled manual workers have migrated. It is accordingly not surprising that the migrant children tend to be of higher average intelligence and to belong

to smaller families. In general, migration appears to be more frequent among the children who enjoy better social and economic conditions of living. The tendency also appears to be for the cities to attract the families containing the more intelligent children, and the Other Areas the less intelligent.

What ultimate effect these tendencies will have either upon the well-being of the community or the well-being of the children, we cannot say. It would not be to the advantage of the country as a whole if there were a concentration of the more intelligent members of the population in the cities and large urban centres; on the basis of the survey data there is, however, no sign of this. It is also a moot point whether migration is of ultimate benefit to the children themselves. Changes of school, companions, and surroundings are not always regarded as beneficial; on the other hand, the greater mobility of certain occupational classes may in itself be the result of the parents' desire to obtain the best opportunities for their children. The similarity between the migrant children and the high scorers (see chapter VI) is close, and our data give us no reason to believe that migration is deleterious to the intellectual, social or physical well-being of the children.

EDUCATION AND OCCUPATIONAL CLASS

(*a*) *Attendance at School*

We close this review of the social background of the survey children with a short examination of what can be termed the educational outlook of parents in the various occupational classes. Interest in the child's education is perhaps most directly reflected in satisfactory attendance at school. We have taken an attendance of ninety per cent or more during the current session of the survey year as representing satisfactory attendance. The average attendance is actually higher, of the order of ninety-four per cent; and in round figures, about seventy per cent of the children have recorded percentage attendances of ninety or over. When the attendances of the children are analysed according to family size and occupational class, table LXXV is obtained.

The proportion of satisfactory attendance varies considerably between the different occupational classes, from about 57 per

cent of the children of agricultural workers to about 80 per cent of the children of small employers. The poorest attenders are the children from the two rural groups, the farmers and the agricultural workers. The circumstances of these two groups are rather different from those of the others, and various reasons for the high proportion of unsatisfactory attendance can easily be adduced. Still, nearly half of the children of agricultural workers fail to reach a standard of ninety per cent of school attendances. The incidence of satisfactory school attendance

TABLE LXXV

Percentage of Thirty-six-day Sample with Satisfactory Attendance by Occupational Class and Family Size*

Family Size	*Occupational Class* 1	2	3	4	5	6	7	8	9
Small	71·0	80·4	73·3	78·8	77·6	72·0	72·0	57·8	59·5
	(131)	(158)	(161)	(259)	(903)	(304)	(240)	(45)	(116)
Medium	72·5	80·6	76·0	73·4	70·5	69·1	66·8	64·8	59·8
	(80)	(124)	(71)	(229)	(956)	(483)	(446)	(54)	(167)
Large	90·5	72·4	59·1	66·0	63·9	57·5	54·0	58·2	51·5
	(21)	(58)	(22)	(94)	(677)	(490)	(533)	(43)	(173)
All	73·3	79·1	72·8	74·6	71·3	65·4	62·3	60·1	56·6
	(232)	(340)	(254)	(582)	(2536)	(1277)	(1219)	(142)	(456)

*The figures in the table give the percentage of children whose attendance is ninety per cent or over, and the figures in brackets give the number of children from whom the percentage of satisfactory attenders has been derived.

among the children of the different occupational groups is not exactly parallel to the average group test scores. But a broad correspondence does exist; and the general tendency is for the best attendance at school to be associated with those occupational groups in which the children appear to have the best living conditions.

Apart from occupational classes 1 and 4, where the possibility of sampling error is considerable, the size of family does not appear to have much effect on school attendance except in the occupational classes where the average size of family is large. It is in occupational classes 5, 6 and 7 that the proportion of unsatisfactory attendance appears to increase for the large families (families of five or more children); in the two rural occupational classes the attendance is poor in any case. It

appears that the differences between the occupational groups is largely due to the increase in unsatisfactory attendance among the large families in the groups where large families most frequently occur. For the small families, those of one or two children, there is little difference in the incidence of satisfactory attendance among the children. It is the children from the large families in homes of lower socio-economic status that are the poor attenders. The data given in table LXXVI support this conclusion. Sampling variations apart, it is in the large families in the most crowded homes that the poorest attendance is to be found.

TABLE LXXVI

PERCENTAGE OF THIRTY-SIX-DAY SAMPLE WITH SATISFACTORY ATTENDANCE BY OCCUPANCY RATE AND FAMILY SIZE*

	Non-manual Workers				*Manual Workers*				*All Workers*
	Family Size				*Family Size*				*for all*
Occupancy Rate	*Small*	*Medium*	*Large*	*All*	*Small*	*Medium*	*Large*	*All*	*Family Sizes*
1	72·2	73·1	77·8	72·7	66·7	79·1	35·3	69·6	71·7
	(284)	(108)	(18)	(410)	(99)	(91)	(17)	(207)	(617)
2	79·7	76·7	64·9	76·4	76·6	69·3	60·2	70·5	72·1
	(359)	(305)	(114)	(778)	(867)	(844)	(417)	(2128)	(2906)
3	74·4	73·4	70·1	72·9	72·1	69·3	55·8	64·5	65·5
	(91)	(109)	(67)	(267)	(438)	(712)	(782)	(1932)	(2199)
4	70·0	63·3	62·2	63·6	67·5	66·4	58·7	62·5	62·6
	(10)	(30)	(37)	(77)	(151)	(441)	(649)	(1241)	(1318)
All	76·0	74·6	66·9	74·1	73·8	69·1	57·6	66·5	68·2
	(744)	(552)	(236)	(1532)	(1555)	(2088)	(1865)	(5508)	(7040)

*The figures in the table give the percentage of children whose attendance is ninety per cent or over, and the figures in brackets give the number of children from whom the percentage of satisfactory attenders has been derived.

The general pattern of the relationship between social conditions, family size, and satisfactory attendance is fairly clear. The attendance of children from small families is, in general, better than that of children from large families. In the occupational classes where the average family size is small, the attendance is better than in those where the average family size is large. But the essential distinction between occupational groups is that, even where the families are large, the children from the groups in which the better social and family conditions prevail appear to attend school more frequently than the

children from the other occupational classes. In the more favourable home conditions, the parents appear to be more concerned with their children's educational progress. We may finally note that the amount of satisfactory attendance does not vary significantly between children living in the four types of area, the cities, large towns, small towns, and Other Areas, though the effect of differences in family size upon attendance are more marked in the urban districts than in the Other Areas.

(*b*) *Private Schools*

There are also marked differences between occupational groups in the number of children who attend private schools. We have defined a private school as one which is not administered by an education authority. Direct grant schools are included in the private schools. Appendix table 46 gives the data for children attending private schools. The proportion of children attending private schools is very small, being only three per cent of all the thirty-six-day-sample children. The proportion of boys at private schools is higher than that of girls, being 3·5 per cent as compared with 2·5 per cent. It is the parents from occupational classes 1 and 3 who most favour private schools for their children. One child in three, or 34·3 per cent to be exact, of the children of professional men or large employers, attends a private school. At the other end of the scale, only 0·6 per cent of the children of unskilled manual workers[1] and none of the children of agricultural workers attend private schools. The children in private schools appear to come almost entirely from the occupational classes where the families are small and the average test score is high. Table LXXVII throws further light upon the practices of the different occupational classes in the education of their children.

Only the occupational classes in which a significant number of children attend private schools appear in table LXXVII. For all occupational classes the proportion of children attending private schools grows smaller as the size of family increases. There is one exception to this, the boys from occupational

[1] Orphanages and schools administered by the Home Department of the Scottish Office are classed in the survey as private schools. It is these schools that the children of unskilled manual workers are most likely to be attending.

class 1. It would appear that the parents in this occupational class are more concerned about the educational opportunities of their sons than of their daughters, for there is little doubt that these parents believe that the social advantages of private schools are superior. The proportion of the sons of professional men and large employers attending private schools remains relatively constant for all family sizes, but in the larger families the proportion of girls at private schools is relatively small. Where the numbers are large enough to make a reasonable assessment possible, the trend is the same for all occupational classes; the proportion of boys at private schools is larger than

TABLE LXXVII

PERCENTAGE OF CHILDREN ATTENDING PRIVATE SCHOOLS BY FAMILY SIZE AND SEX FOR CERTAIN OCCUPATIONAL CLASSES

	Size of Family									
Occupational	*Small*			*Medium*			*Large*			*All*
Class	*Boys*	*Girls*	*Both*	*Boys*	*Girls*	*Both*	*Boys*	*Girls*	*Both*	
1	36·6 (71)*	37·9 (66)	37·2 (137)	38·6 (44)	24·3 (37)	32·1 (81)	40·0 (5)	15·4 (13)	22·2 (18)	34·3 (236)
2	9·5 (84)	5·3 (76)	7·5 (160)	6·3 (63)	1·6 (62)	4·0 (125)	— (31)	3·7 (27)	1·7 (58)	5·2 (343)
3	21·7 (83)	14·1 (78)	18·0 (161)	10·8 (37)	8·8 (34)	9·9 (71)	12·5 (8)	— (14)	4·5 (22)	14·6 (254)
4	8·5 (118)	6·3 (143)	7·3 (261)	3·4 (117)	0·9 (116)	2·1 (233)	— (39)	— (57)	— (96)	4·1 (590)
5	2·0 (455)	2·8 (460)	2·4 (915)	1·4 (629)	0·7 (605)	1·1 (1234)	— (211)	— (201)	— (412)	1·4 (2561)
All Five Classes	8·8 (811)	7·5 (823)	8·1 (1634)	4·2 (890)	2·1 (854)	3·2 (1744)	1·0 (294)	1·0 (312)	1·0 (606)	

*The number in brackets is the total number of pupils in the category; the percentages give the proportion attending private schools

the proportion of girls. It is true that the number of places available in private schools is greater for boys than for girls the majority of the large direct grant schools being boys', schools; but it is also probable that this disproportion in supply is not accidental, but a reflection of the educational demands of the parents.

(c) *Evacuation*

We present in appendix table 47 the data for children evacuated during the 1939-45 war. About sixteen per cent of the

children were evacuated, but the only point of distinction is a geographical one, the proportion of city children evacuated being much greater than that for any of the other localities. Occupational class and family size appear to exert little influence on the incidence of evacuation. Modern war is no respecter of social distinctions.

EDUCATION AND OCCUPATIONAL CLASS—CONCLUSIONS

In conclusion we again note the strong influence of occupational class on the education of the children. It is the parents who are professional men, employers, or salaried employees who appear, on the evidence available, to attach most importance to the education of their children. The children from these groups have the best records of school attendance. The test of the parents' attitude to education is in the large families, where various kinds of domestic crises are most likely to occur. If there is illness in the family, for example, it is tempting to keep a child off school to help in the home. Some parents, attaching more importance to school education, resist the temptation; others do not, and the child's record of attendance is accordingly poor. Likewise, there are differences in the occupational classes of children attending private schools. These schools are virtually all fee-paying, and the difference in the proportions of children attending private schools is in itself an indication of the value the parents place upon the educational opportunities they can offer to their children. The evidence on the educational attitudes and practices of the different occupational classes reinforces what we have already said about the distinctions between the various occupational classes.

CONCLUSION

We have now reviewed the available evidence relating to the social background of the children in the thirty-six-day sample. There are many powerful social influences on a child's development which cannot be directly measured. Such imponderables as the parents' ambitions for the family, the standard of living aimed at, and their conception of a parent's responsibility towards his children can only be assessed by inference from such purely factual data as we have at our disposal. But it can be

said that all the data point in the same direction. The smaller families, the better housing conditions, the better physical development, and the better school attendance of some children all point to a difference in the attitudes and values of the parents. The common factor in these differences appears to be occupational class. Differences between the children according to occupational class are considerable, and indicate distinctions not only in material conditions but in the imponderables as well. Smaller families imply not only more opportunity for each child in the family, but also a way of living into which large families do not easily fit. Not only are the conditions of life different for the child, but the whole way of living is also different.

Though our knowledge of the attitudes, beliefs and values of the parents from the various occupational classes is wanting, it is also true that our record of certain of the more concrete sociological data relating to the children's living conditions is not entirely complete. The record of the family situation, for instance, is substantially correct, but is not complete in all its details. The number of children in the family is the number of children alive in the year that the survey was made. For a more thorough appreciation of family structure we should require to know the number of all the live-born children, the child's position in that family, and the date of the mother's marriage, as well as the date of her birth. Similarly, fuller information about migration and the parents' education would have helped to make the picture clearer.

Our main interest is in the social conditions under which our survey children live. We have noted that these conditions tend to form certain fairly clear patterns centred in the socio-economic status of the home, as indicated by the occupation of the father. There is, at one end of the socio-economic scale, the pattern of small families, older parents, more favourable housing conditions, with children above average in intelligence and physique, and at the other end of the scale, the large families, low housing standards, poor school attendance, and children below average in intelligence and in physical development.

On the effect these differences have on the future of the children, the survey data cannot enlighten us. The survey

raises more questions than it answers. What will be the future of the intelligent children from the less favourable social environments, and what will happen to the dull children from the homes of higher socio-economic status? The educational and vocational progress of some twelve hundred of the survey children is being followed; it is from these twelve hundred children that we hope to obtain the answers to some of the many questions that the survey raises.

Note: It has been pointed out that the interpretation of tables LXXI (p 181), LXXII (p 182), LXXIII (p 183) and LXXIV (p 183) may cause difficulty. In each of these tables the figures in the row entitled 'All born in' refer to the whole thirty-six-day sample, classified according to place of birth. The row entitled 'All living in' refers to the same set of pupils, this time classified according to place of residence in 1947. The row entitled 'Migrated from' refers only to the migrant children, classified by place of birth, and the row entitled 'Migrated to' refers to the same set of migrants, classified by place of residence in 1947.

APPENDIX TABLES

APPENDIX TABLES

In the following tables the original distributions obtained from the counter-sorter are set out as grids, and a certain amount of computation is appended. These computations have been performed in working units, the size of the unit and the origin being stated in each case. Throughout, only negative signs have been entered; all other values are positive. Throughout, the symbol XX stands for 'unknown'; the number of unknown cases for each variable has not always been entered, in order to avoid unnecessarily long and complicated 'book-keeping' entries. For height and weight the calculations have been performed from an origin of 48.5 inches and 62 pounds respectively, but the means have been computed from origins of 48.75 inches and 62.25 pounds. The reason is that the heights were recorded to the nearest *completed* half inch and the weights to the nearest *completed* half pound.

Certain minor discrepancies are known to exist in a few of the tables. It will be found, for instance, that the figures in the fifty-two tables of height and weight by month of birth by month of measurement do not coincide exactly with those in the tables of height and weight by age at date of measurement. The two sets of sortings were made with an interval of nearly a year between them, and with different sets of cards. Of the other tables, the majority were prepared in Edinburgh at Moray House, but a number were prepared at the London School of Economics under the supervision of Professor D. V. Glass. The elimination of such minor discrepancies as exist would often have meant the repetition of several months' work, and where it had been clearly established that these discrepancies did not significantly affect any results, they were allowed to remain.

It cannot be guaranteed, either, that in the fairly large mass of arithmetical calculation no errors occur. None has been

wittingly left uncorrected, but arithmetical errors, hydra-like, increase as others are removed. We are reasonably confident, however, that there have been sufficient checks upon the arithmetical results to ensure that none of the statements in the text is based on significantly erroneous figures.

Unless otherwise indicated, the figures in the tables refer only to the thirty-six-day sample.

LIST OF APPENDIX TABLES

DISTRIBUTION OF WEIGHT

DISTRIBUTION OF TEST SCORE, HEIGHT AND WEIGHT

DISTRIBUTION OF HIGH AND LOW SCORERS

SOCIAL FACTORS

Note:

YY—refers to pupils who, in the opinion of their teacher, were unable to attempt the test owing to mental or physical defect

OO—refers to pupils who attempted the test but obtained no marks

XX—refers to cases where the information is unknown

TABLE 1

DISTRIBUTION OF TEST SCORE BY MONTH OF BIRTH
Maximum: 76 Points
THE WHOLE SURVEY: Boys and Girls

Verbal Score	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70–6	30	26	20	26	16	16	19	18	9	10	6	5	201
65–9	156	151	153	131	132	100	68	83	67	58	51	40	1190
60–4	331	378	343	340	286	259	201	170	159	148	144	116	2875
55–9	540	486	568	517	462	419	399	375	324	286	281	229	4886
50–4	731	628	743	722	640	618	594	538	494	495	451	407	7061
45–9	798	750	847	822	769	789	751	624	633	631	591	572	8577
40–4	791	725	836	831	839	796	715	729	679	694	634	689	8958
35–9	642	658	720	769	749	693	669	705	684	682	648	649	8268
30–4	500	528	650	552	623	614	607	589	562	598	568	640	7031
25–9	408	367	450	471	457	470	450	526	492	514	480	524	5609
20–4	304	292	346	352	431	354	355	371	376	386	430	472	4469
15–9	239	227	298	293	293	312	302	313	327	354	362	399	3719
10–4	166	166	183	208	257	235	266	239	250	295	305	300	2870
5–9	138	135	156	156	181	201	191	209	205	220	262	282	2336
0–4	158	131	155	172	178	213	186	182	191	206	218	233	2223
YY	39	33	37	53	54	52	50	43	42	38	49	42	532
Total	5971	5681	6505	6415	6367	6141	5823	5714	5494	5615	5480	5599	70805
XX	329	342	399	357	421	403	342	368	347	378	336	384	4406
Grand Total	6300	6023	6904	6772	6788	6544	6165	6082	5841	5993	5816	5983	75211

DISTRIBUTION OF TEST SCORE

TABLE 2

Test Score by Month of Birth

(a) Boys and Girls

Verbal Score	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70–6	2	2	4	3		4	2	5		1	1	2	26
65–9	14	9	15	12	12	11	6	4	4	3	4	6	100
60–4	28	42	32	38	29	22	33	22	15	14	13	11	299
55–9	54	49	48	56	48	44	41	40	34	31	31	27	503
50–4	63	59	79	57	58	57	59	60	47	49	36	34	658
45–9	78	70	83	86	88	67	86	66	39	57	58	60	838
40–4	73	75	84	76	70	69	54	75	55	63	65	63	822
35–9	75	53	59	71	76	72	59	72	64	75	56	65	797
30–4	49	49	46	39	57	51	53	62	50	64	66	57	643
25–9	51	37	36	44	56	51	43	66	45	54	52	60	595
20–4	33	31	38	34	43	34	31	42	31	30	43	47	437
15–9	20	24	25	25	31	33	24	41	30	31	26	42	352
10–4	20	18	20	23	33	19	30	18	20	30	39	34	304
5–9	14	6	16	16	13	22	20	14	24	20	28	33	226
0–4	14	15	17	16	15	19	21	17	23	16	15	22	210
YY	3	5	3	3	1	4	6	7	2	2	9	2	47
Total	591	544	605	599	630	579	568	611	483	540	542	565	6857
XX	29	54	38	40	53	47	58	41	37	50	40	36	523
Grand Total	620	598	643	639	683	626	626	652	520	590	582	601	7380

(b) Boys

Verbal Score	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70–6	2	1	1	1		1		3		1	1	1	12
65–9	5	4	9	9	8	6	3	3	1	1	3	4	56
60–4	16	23	16	20	9	12	18	8	9	4	6	3	144
55–9	28	25	25	24	28	23	20	15	16	18	17	11	250
50–4	37	26	40	27	26	21	29	30	26	19	16	13	310
45–9	35	32	38	47	44	33	35	39	20	27	27	25	402
40–4	29	32	44	27	40	37	31	38	29	29	35	28	399
35–9	38	25	32	31	41	30	29	30	37	40	22	31	386
30–4	26	27	23	19	24	29	29	29	21	31	34	19	311
25–9	26	18	17	16	27	26	23	35	25	24	21	26	284
20–4	19	17	23	19	24	19	11	19	20	16	21	20	228
15–9	13	13	11	17	14	19	13	20	19	20	16	21	196
10–4	13	11	11	10	17	7	11	13	8	15	25	20	161
5–9	8	5	11	11	10	12	11	8	8	12	18	19	133
0–4	7	12	12	8	12	10	8	13	12	9	10	10	123
YY	3	2	1	1		3	1	2	1	2	7	2	25
Total	305	273	314	287	324	288	272	305	252	268	279	253	3420
XX	10	22	20	23	23	30	23	23	14	25	19	22	254
Grand Total	315	295	334	310	347	318	295	328	266	293	298	275	3674

TABLE 2—*continued*

Test Score by Month of Birth

(*c*) Girls

Verbal Score	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70–6		1	3	2		3	2	2				1	14
65–9	9	5	6	3	4	5	3	1	3	2	1	2	44
60–4	12	19	16	18	20	10	15	14	6	10	7	8	155
55–9	26	24	23	32	20	21	21	25	18	13	14	16	253
50–4	26	33	39	30	32	36	30	30	21	30	20	21	348
45–9	43	38	45	39	44	34	51	27	19	30	31	35	436
40–4	44	43	40	49	30	32	23	37	26	34	30	35	423
35–9	37	28	27	40	35	42	30	42	27	35	34	34	411
30–4	23	22	23	20	33	22	24	33	29	33	32	38	332
25–9	25	19	19	28	29	25	20	31	20	30	31	34	311
20–4	14	14	15	15	19	15	20	23	11	14	22	27	209
15–9	7	11	14	8	17	14	11	21	11	11	10	21	156
10–4	7	7	9	13	16	12	19	5	12	15	14	14	143
5–9	6	1	5	5	3	10	9	6	16	8	10	14	93
0–4	7	3	5	8	3	9	13	4	11	7	5	12	87
YY		3	2	2	1	1	5	5	1		2		22
Total	286	271	291	312	306	291	296	306	231	272	263	312	3437
XX	19	32	18	17	30	17	35	18	23	25	21	14	269
Grand Total	305	303	309	329	336	308	331	324	254	297	284	326	3706

Test Score by Month of Birth

x = test score in units of five points with origin at -3 points
y = age in units of one month with origin at 125 months
b = regression of test score on age
r = correlation of test score and age

Boys ($n = 3420$)

$\Sigma x = 26647$ $\Sigma x^2 = 245137$ $\Sigma' x^2 = 37552{\cdot}34$
$\Sigma y = 22774$ $\Sigma y^2 = 191678$ $\Sigma' y^2 = 40024{\cdot}46$
$\Sigma xy = 182959$ $\Sigma' xy = 5514{\cdot}91$

$bxy = +0{\cdot}138$ $rxy = +0{\cdot}142$

Girls ($n = 3437$)

$\Sigma x = 27743$ $\Sigma x^2 = 257629$ $\Sigma' x^2 = 33691{\cdot}25$
$\Sigma y = 22500$ $\Sigma y^2 = 188004$ $\Sigma' y^2 = 40709{\cdot}85$
$\Sigma xy = 186982$ $\Sigma' xy = 5365{\cdot}04$

$bxy = +0{\cdot}132$ $rxy = +0{\cdot}145$

TABLE 3

Test Score by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 10

Size of Family

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
70–6	2	2	3	1													8		8
65–9	2	7	6														15		15
60–4	7	13	6	2													28		28
55–9	4	9	9	4	1	1											28		28
50–4	2	11	4	3	1	1	1										23		23
45–9	6	6	2	1													15		15
40–4	2	4	5	1		1											13		13
35–9		1	2	1	1												5		5
30–4			1	1													2		2
25–9	1	1	2														4		4
20–4	1	1															2		2
15–9																			
10–4																			
5–9																			
0–4																			
YY																			
Total	27	55	40	14	3	3	1										143		143
XX	4	5	2														11	1	12
Grand Total	31	60	42	14	3	3	1										154	1	155

Father's Occupation Group 20

Size of Family

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
70–6		1	1														2		2
65–9	1	1	2														4		4
60–4	3	6															9		9
55–9	4	2	4	3	1	1	1										16		16
50–4		4	3	1													8		8
45–9		4	3														7		7
40–4	1	4		1		1			1		1						9		9
35–9	1	4	1		2												8		8
30–4	1	1	2			1											5		5
25–9	1	2				1		1									5		5
20–4	1	1		1													3		3
15–9		1															1		1
10–4						1											1		1
5–9																			
0–4																			
YY																			
Total	13	31	16	6	3	5	1	1	1		1						78		78
XX		3	3														6		6
Grand Total	13	34	19	6	3	5	1	1	1		1						84		84

TABLE 3—*continued*

Test Score by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 30

Test Score	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	Un-known	Grand Total
70–6	3	1															4		4
65–9	3	3	2	1		1											10		10
60–4	4	8	3	1	1	2											19		19
55–9	7	11	10	5	1		2										36	1	37
50–4	12	20	17	3	3												55		55
45–9	9	13	11	6	1	2	1										43		43
40–4	6	10	10	8		1	1			1	1						38	2	40
35–9	7	11	6	7	4	4	2	2									43		43
30–4	1	5	3	8	2		1	1	1	1							23	1	24
25–9	4	6	4	6	1												21		21
20–4	1	1	1	1	3	1	1										9	1	10
15–9	1	2	5	1	1	1	1	1									13		13
10–4		2	2		1		1										6		6
5–9		1	1		2	1		1									6		6
0–4		1		1		2											4		4
YY																			
Total	58	95	75	48	20	15	10	5	1	2	1						330	5	335
XX	3	4	1	1		2	1				1						13		13
Grand Total	61	99	76	49	20	17	11	5	1	2	2						343	5	348

Father's Occupation Groups 41 and 42

Test Score	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	Un-known	Grand Total
70–6			1														1		1
65–9	2	6	3		2												13		13
60–4	11	12	5				2										30		30
55–9	5	20	9	2													36		36
50–4	11	13	9	4	2												39		39
45–9	12	11	6	3			4	1									37		37
40–4	8	10	4	6		1											29		29
35–9	2	11	1	2	1			1									18		18
30–4	3	3	2														8		8
25–9		4		3	1						1						9		9
20–4	1	2	2	1	1												7		7
15–9		1			1		1										3		3
10–4	1		1														2		2
5–9			1														1		1
0–4	1																1		1
YY		2															2		2
Total	57	95	44	21	8	1	7	2			1						236		236
XX	3	8	5	1	2	1											20		20
Grand Total	60	103	49	22	10	2	7	2			1						256		256

TABLE 3—*continued*

Test Score by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 51

	Size of Family																		
Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Un-known*	*Grand Total*
70–6			1														1		1
65–9	2	1	3		1												7		7
60–4	6	5	4	1	1	1											18		18
55–9	8	8	5		1												22		22
50–4	5	7	5	1		1											19		19
45–9	5	3	8	2	2				1								21		21
40–4	2	9	4	2	1		1										19		19
35–9	1	3	1	1	3		1										10		10
30–4	1	3	6	2	1						1						14		14
25–9		5	1	1													7		7
20–4	1		1	1													3		3
15–9																			
10–4	1				1												2		2
5–9			1														1	1	2
0–4																			
YY																			
Total	32	44	40	11	11	2	2		1		1						144	1	145
XX	1	2	6														9		9
Grand Total	33	46	46	11	11	2	2		1		1						153	1	154

Father's Occupation Group 52

	Size of Family																		
Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Un-known*	*Grand Total*
70–6	1	2															3		3
65–9	1	2	1	3													7		7
60–4	2	13	9	2													26	1	27
55–9	6	14	21	6	1		1										49		49
50–4	8	18	13	5	4		1										49		49
45–9	9	22	15	9	8	2	1	1	1		1						69		69
40–4	9	16	10	5	5		1		2								48		48
35–9	4	14	13	9	7		3	1	1					1			53		53
30–4		8	9	3	6	1	1			1							29		29
25–9	4	6	9	6	3	1	2		3								34		34
20–4		6	3	7	4	1		1	1								23		23
15–9			2	1	1	2	1	1									8		8
10–4			2	1		1											4		4
5–9	1	1		1		1	1										5		5
0–4			2	1	1	1											5		5
YY																			
Total	45	122	109	59	40	10	12	4	8	1	1			1			412	1	413
XX	5	10	6	3	1	1											26	1	27
Grand Total	50	132	115	62	41	11	12	4	8	1	1			1			438	2	440

TABLE 3—*continued*

Test Score by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 61

Test Score	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
70–6	2	2				1											5		5
65–9	8	9	9	1													27		27
60–4	14	40	23	9	8	2		3	1								100	1	101
55–9	30	60	42	15	13	6	1	1	1								169	1	170
50–4	34	70	64	36	20	10	6	3	1	1							245	1	246
45–9	43	84	88	58	16	12	9	5	5	1							321	1	322
40–4	38	83	61	51	38	19	9	7	4	2	3	1					316	2	318
35–9	28	63	63	47	38	22	13	6	4	1	1		1	1			288	1	289
30–4	20	52	41	40	30	15	8	7		1	1						215	1	216
25–9	12	44	42	40	20	21	10	4	6	7							206		206
20–4	10	25	21	26	18	20	9	3	1			1			1		135	1	136
15–9	11	23	20	16	25	7	4	2	3	5	1	1	1				119		119
10–4	5	15	18	22	9	12	3	3	3	1	3	2					96	2	98
5–9	7	13	11	6	9	11	12	4	3		2						78	1	79
0–4	6	7	12	6	9	6	2	5	2	1	1	1			1		59		59
YY		3	1	4	3		1	1									13		13
Total	268	593	516	377	256	164	87	54	34	20	12	6	2	1	2		2392	12	2404
XX	22	30	37	31	17	10	5	6	5	2	1	1					167	1	168
Grand Total	290	623	553	408	273	174	92	60	39	22	13	7	2	1	2		2559	13	2572

Father's Occupation Group 62

Test Score	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
70–6																			
65–9	1	1	1														3		3
60–4	3	4	5	5	2	2	1		1								23		23
55–9	3	13	8	11	2	2	2				2						43		43
50–4	8	23	16	16	5	4	3	3	1								79		79
45–9	3	29	25	15	9	6	5	1		2							95		95
40–4	8	16	28	16	19	7	7	10		4							115		115
35–9	6	20	24	29	16	9	2	5	2	3			1				117		117
30–4	11	12	17	23	11	5	8	7		2	4						100	1	101
25–9	4	8	18	15	21	6	6	3		2							83		83
20–4	2	9	11	11	19	5	4	8	2		2	1		1			75		75
15–9	4	6	13	9	10	13	5	1	3						1		65		65
10–4	4	6	6	8	8	5	5	2	6	2	1						53	1	54
5–9	3	3	4	7	5	5	4	2	1	1		1					36		36
0–4	1	5	7	5	7	5	3	6	2	2							43	1	44
YY		2	2	1	1			1	1								8		8
Total	61	157	185	171	135	74	55	49	19	18	9	2	1	1	1		938	3	941
XX	8	16	11	10	11	6	8	4	1	3							78		78
Grand Total	69	173	196	181	146	80	63	53	20	21	9	2	1	1	1		1016	3	1019

TABLE 3—*continued*

Test Score by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 6X

Size of Family

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
70–6																			
65–9		1															1		1
60–4		1	1	2													4		4
55–9	3	1	1	2		2											9		9
50–4	1	4	8	2	4	3											22		22
45–9	5	7	2	3	2	5	2										26	1	27
40–4	3	8	13	6	3	2		1	1				2				39		39
35–9	2	2	9	4	3	4	4	1									29	1	30
30–4	3	4	6	4	2	3	2	1		2	1						28	1	29
25–9	2	7	8	10	4	2	2	1		1							37		37
20–4		1	3	3	2		2			2							13	2	15
15–9	1	2	4	1		4	1										13		13
10–4	2	1	4	2	1	2			1								13		13
5–9				3	1	2	1	2									9		9
0–4			3		2	1	1	1									8	1	9
YY			1														1		1
Total	22	39	63	42	24	30	15	7	2	5	1		2				252	6	258
XX	2	3	3	1	4	2	3	1		1							20		20
Grand Total	24	42	66	43	28	32	18	8	2	6	1		2				272	6	278

Father's Occupation Group 63

Size of Family

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
70–6		1															1		1
65–9	2	1	1	1		1											6		6
60–4	2	2	7	2	1	1	1		1								17		17
55–9	3	14	8	9	6	3	2	1		1							47		47
50–4	6	9	9	16	11	3	5	3	1								63		63
45–9	12	22	22	28	15	5	8	3	3	2	1						121	1	122
40–4	9	18	23	27	9	12	9	5	2	4							118		118
35–9	10	21	20	33	19	10	13	4	2	2	4						138	2	140
30–4	9	19	28	21	14	6	11	11	4	2	1	2					128	1	129
25–9	9	8	20	19	15	16	3	7	4	1			1	1			104	1	105
20–4	7	15	15	19	9	13	8	5	3	2		1					97		97
15–9	4	3	16	14	10	12	6	6	3	2	1		1				78	3	81
10–4	2	6	10	20	11	8	10	10	3	1	1	1	1	1			85	1	86
5–9	5	6	8	6	9	6	9	7	4	2							62		62
0–4	3	5	6	9	12	20	4	7		1							67		67
YY																			
Total	83	150	193	224	141	116	89	69	30	20	8	4	3	2			1132	9	1141
XX	3	4	14	23	13	14	14	11	4	1	2	1					104		104
Grand Total	86	154	207	247	154	130	103	80	34	21	10	5	3	2			1236	9	1245

TABLE 3—*continued*

Test Score by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 70

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	Unknown	Grand Total
	Size of Family																		
70–6																			
65–9		1	1														2		2
60–4		4	1	1													6		6
55–9	1	3	2	3	1					1							11		11
50–4	1	3	3	1	1	1				1							11		11
45–9	2	4	4	2	3	1	1	1	1								19		19
40–4	2	3	3	1	3		1	1					1				15		15
35–9		5	4	3	1	1	1										15		15
30–4		3	5	1	2			1		1	1						14	1	15
25–9		2	2	6	1	1	1	1									14		14
20–4		2	1	3		1	1	1									9		9
15–9	3	2	1	2	4		1										13		13
10–4	1	1				2	1										5		5
5–9	2	2	1	1													6		6
0–4			1					1									2		2
YY																			
Total	12	35	29	24	16	7	7	6	1	3	1		1				142	1	143
XX		1		1	1												3		3
Grand Total	12	36	29	25	17	7	7	6	1	3	1		1				145	1	146

Father's Occupation Group 80

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	Unknown	Grand Total
	Size of Family																		
70–6																			
65–9	1	1		1	1												4		4
60–4		7		1	1	1											10		10
55–9	4	6	2	5		1			1						1		20		20
50–4	5	6	5	4	6	2											28		28
45–9	4	9	13	9	7	2			1								45		45
40–4	3	8	10	11	7	3	1		1	1							45		45
35–9	5	5	15	10	5	5	2	2	2	1							52	1	53
30–4	4	7	9	12	6	5	3	3	2							1	52	1	53
25–9	2	4	8	5	2	5	5	2	1		1						35	1	36
20–4	2	8	8	4	4	5	5	2	3	1	1						43		43
15–9	3	3	4	3	5		2	1	2		1				1		25		25
10–4	4	3	2	4	2		4	1	3								23		23
5–9	3	3	2	2	2	1	1		1				1				16	1	17
0–4	1	2	5	5	5	3	2	3	2	1	1						30	1	31
YY																			
Total	41	72	83	76	53	33	25	14	19	4	4		1		2	1	428	5	433
XX	6	3	9	3	8	5	3	3	3	2							45		45
Grand Total	47	75	92	79	61	38	28	17	22	6	4		1		2	1	473	5	478

TABLE 3—*continued*

Test Score by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group Unknown

Test Score	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Un-known*	*Grand Total*
70–6		1															1		1
65–9		1															1		1
60–4	2	1	3		1												7		7
55–9	4	3	2		1	1											11	1	12
50–4	5	5	2	2		1											15		15
45–9	5	6	2	2		1											16	1	17
40–4	7	2	4		2												15		15
35–9	1	3	6	5	2	1											18	1	19
30–4	2	3	9		1	1	1			1							18		18
25–9	6	7	7	5	1	2		1	1	2							32		32
20–4	1	1	5	3	1	1	1	1									14		14
15–9	1	1	2	1	1	2		2									10	1	11
10–4	2	1	2	1	1	1	2										10		10
5–9		2		1			1										4		4
0–4	4	3			2	1	1										11		11
YY																			
Total	40	40	44	20	13	12	6	4	1	3							183	4	187
XX	3	2	4	1	2	3	1			1							17	1	18
Grand Total	43	42	48	21	15	15	7	4	1	4							200	5	205

TABLE 3—*continued*

Test Score by Size of Family for Father's Occupation
(excluding cases where size of family is not known)

x = test score in units of five points with origin at 37

Father's Occupation		*Size of Family* 1	2	3	4	5	6	7	8	9	10	11+	*Total*
10	n	27	55	40	14	7*							143
	Σx	92	201	139	44	18							494
	Σx^2	466	959	715	196	60							2396
	Mean Test Score	54·0	55·3	54·4	52·7	49·9							

Overall[1] mean for test score: 54·3

[1] The word 'overall' is used when the mean includes the cases where the size of family or other variable is unknown.

Father's Occupation		1	2	3	4	5	6	7	8	9	10	11+	Total
20	n	13	31	16	18*								78
	Σx	32	63	48	18								161
	Σx^2	190	357	226	152								925
	Mean Test Score	49·3	47·2	52·0	42·0								

Overall mean for test score: 47·3

Father's Occupation		1	2	3	4	5	6	7	8	9	10	11+	Total
30	n	58	95	75	48	20	15	10	9*				330
	Σx	131	154	100	26	−14	−6	−2	−11				380
	Σx^2	659	980	708	306	218	254	88	57				3270
	Mean Test Score	48·3	45·1	43·7	39·7	33·5	35·0	36·0	30·9				

Overall mean for test score: 42·7

Father's Occupation		1	2	3	4	5	6	7	8	9	10	11+	Total
41, 42	n	57	95	44	21	19*							236
	Σx	134	212	110	23	24							503
	Σx^2	668	1060	616	107	210							2661
	Mean Test Score	48·8	48·2	49·5	42·5	43·3							

Overall mean for test score: 47·7

Father's Occupation		1	2	3	4	5	6	7	8	9	10	11+	Total
51	n	32	44	40	11	11	6*						144
	Σx	92	86	83	7	14	10						292
	Σx^2	452	396	473	59	112	40						1532
	Mean Test Score	51·4	46·8	47·4	40·2	43·4	45·3						

Overall mean for test score: 47·1

Father's Occupation		1	2	3	4	5	6	7	8	9	10	11+	Total
52	n	45	122	109	59	40	10	12	4	11*			412
	Σx	84	217	146	32	2	−28	−5	−5	−4			439
	Σx^2	400	1107	1036	556	208	164	91	29	32			3623
	Mean Test Score	46·3	45·9	43·7	39·7	37·3	23·0	34·9	30·8	35·2			

Overall mean for test score: 42·3

* Includes larger sizes of family

TABLE 3—*continued*

Test Score by Size of Family for Father's Occupation

Father's Occupation		*Size of Family* 1	2	3	4	5	6	7	8	9	10	11 +	*Total*
61	n	268	593	516	377	256	164	87	54	34	20	23*	2392
	Σx	251	439	251	−92	−185	−199	−130	−68	−48	−40	−73	106
	Σx^2	2737	5585	4761	3054	2499	1733	962	740	436	198	415	23120
	Mean Test Score	41·7	40·7	39·4	35·8	33·4	30·9	29·5	30·7	29·9	27·0	21·1	
	Overall mean for test score: 37·2												
62	n	61	157	185	171	135	74	55	49	19	18	14*	938
	Σx	−15	45	−66	−83	−206	−125	−83	−91	−67	−28	−23	−742
	Σx^2	617	1505	1692	1593	1380	981	675	613	433	206	149	9844
	Mean Test Score	35·8	38·4	35·2	34·6	29·4	28·6	29·5	27·7	19·4	29·2	28·8	
	Overall mean for test score: 33·0												
6x	n	22	39	63	42	24	30	15	7	10*			252
	Σx	7	15	−45	−29	−22	−23	−25	−21	−13			−156
	Σx^2	157	247	559	363	242	327	137	127	53			2212
	Mean Test Score	38·6	38·9	33·4	33·6	32·4	33·2	28·7	22·0	30·5			
	Overall mean for test score: 33·9												
63	n	83	150	193	224	141	116	89	69	30	20	17*	1132
	Σx	−40	−25	−150	−188	−203	−287	−144	−181	−56	−30	−36	−1340
	Σx^2	830	1391	1862	2162	1791	1943	1104	1085	362	230	156	12916
	Mean Test Score	34·6	36·1	33·1	32·8	29·8	24·6	28·9	23·9	27·7	29·5	26·4	
	Overall mean for test score: 31·1												
70	n	12	35	29	24	16	7	7	12*				142
	Σx	−16	20	10	−11	−4	−10	−11	−2				−24
	Σx^2	180	388	262	211	110	76	59	100				1386
	Mean Test Score	30·3	39·9	38·7	34·7	35·8	29·9	29·1	36·2				
	Overall mean for test score: 36·2												
80	n	41	72	83	76	53	33	25	14	19	12*		428
	Σx	−23	11	−63	−41	−49	−35	−75	−43	−49	−32		−399
	Σx^2	499	829	683	757	647	323	335	217	295	206		4791
	Mean Test Score	34·2	37·8	33·2	34·3	32·8	31·7	22·0	21·6	24·1	25·7		
	Overall mean for test score: 32·3												

* Includes larger sizes of family

TABLE 3—*continued*

Test Score by Size of Family for Occupational Classes 1, 4 and 6*

Occupational Class		*Size of Family* 1	2	3	4	5	6	7	8	9	10	11+	*Total*
I	n	40	86	56	20	19							221
	Σx	124	264	187	57	23							655
	Σx^2	656	1316	941	231	177							3321
	Mean Test Score	52·5	52·3	53·7	51·3	43·1							
	Overall mean for test score: 51·8												
4	n	77	166	149	70	51	12	14	4	13			556
	Σx	176	303	229	39	16	−20	−4	−5	−3			731
	Σx^2	852	1503	1509	615	320	198	92	29	37			5155
	Mean Test Score	48·4	46·1	45·7	39·8	38·6	28·7	35·6	30·7	35·8			
	Overall mean for test score: 43·6												
6	n	83	196	248	213	159	104	70	56	21	23	17	1190
	Σx	−8	60	−111	−112	−228	−148	−108	−112	−71	−38	−22	−898
	Σx^2	774	1752	2251	1956	1622	1308	812	740	459	230	152	12056
	Mean Test Score	36·2	38·5	34·8	34·4	29·8	29·9	29·3	27·0	20·1	28·7	30·5	
	Overall mean for test score: 33·2												

*See p 77 for conversion of 'father's occupation' to 'occupational class'

TABLE 3—*continued*

MEAN SIZE OF FAMILY AND MEAN TEST SCORE FOR FATHER'S OCCUPATION

	Father's Occupation													
	10	20	30	41, 42	51	52	61	62	6x	63	70	80	*Unknown*	*Total*
Including test absentees														
Number of families	154	84	343	256	153	438	2559	1016	272	1236	145	473	200	7329
Total number in families	373	242	1053	639	408	1401	9228	4357	1115	5667	558	2015	650	27706
Mean size of family	2·42	2·88	3·07	2·50	2·60	3·20	3·61	4·29	4·10	4·58	3·85	4·26	3·25	3·78
	2·58				3·06			4·25						
Excluding test absentees														
Number of families	143	78	330	236	144	412	2392	938	252	1132	142	428	184	6811
Total number in families	353	227	1005	585	385	1335	8605	4026	1023	5071	547	1802	587	25551
Mean size of family	2·47	2·91	3·05	2·49	2·67	3·24	3·60	4·29	4·06	4·48	3·85	4·21	3·19	3·75
Mean test score	54·3	47·3	42·7	47·7	47·1	42·3	37·2	33·0	33·9	31·1	36·2	32·3	33·3	36·79
Variance test score	121·4	192·4	215·6	179·5	164·3	191·9	241·7	247·0	210·7	250·4	245·0	258·7	267·8	251·64

TABLE 4

Test Score by Size of Family for Occupancy Rate

Boys and Girls

Occupancy Rate 1

Test Score	1	2	3	4	5	6	7	8	9	10	11	12 +	Total	Unknown	Grand Total
70–6	4	5	2										11		11
65–9	9	15	7		2								33		33
60–4	23	38	12	2		2							77		77
55–9	30	27	21	8	1	2							89		89
50–4	24	38	14	6	1		1						84		84
45–9	30	24	8	4	2	1	1						70		70
40–4	18	24	12	5	2	2							63		63
35–9	10	15	5	4	3								37		37
30–4	9	7	7	2	2								27	2	29
25–9	7	10	6	3	1								27		27
20–4	3	1	5	4	1				1				15		15
15–9	3	2	4	1	2				1				13		13
10–4	2	2		2		1							7		7
5–9	5	2	1		1								9		9
0–4	1					2							3		3
YY			1			1							2		2
Total	178	210	105	41	18	11	2		2				567	2	569
XX	13	12	10	1	2	1	1						40	1	41
Grand Total	191	222	115	42	20	12	3		2				607	3	610

Occupancy Rate 2

Test Score	1	2	3	4	5	6	7	8	9	10	11	12 +	Total	Unknown	Grand Total
70–6	4	3	4	1									12		12
65–9	11	15	21	5	2	1							55		55
60–4	28	56	39	11	9	2	4	1	1				151	1	152
55–9	45	90	65	24	11	3	4	1	1	1			245	2	247
50–4	63	100	87	35	31	10	4	4					334	1	335
45–9	74	100	112	57	21	10	6	4	4	1	2		391		391
40–4	61	82	85	52	30	9	13	5	4	2			343	3	346
35–9	42	88	87	54	28	7	9	5	4	1			325	2	327
30–4	35	56	66	39	24	9	10	8	2	2			251	3	254
25–9	29	52	58	44	17	9	7	3	4	4		1	228		228
20–4	20	28	31	29	22	12	5	4	1			1	153		153
15–9	19	21	25	13	17	7	5	1	1		2		111	1	112
10–4	15	11	17	15	12	6	6	1				1	84		84
5–9	8	14	10	9	6	4	5	2	1			1	60	1	61
0–4	8	5	16	9	14	9	2	4	1		1		69	1	70
YY	2	6	3	1	2	1	1	1							
Total	464	727	726	398	246	99	81	44	24	11	5	4	2829	15	2844
XX	38	42	48	26	16	9	9	2	2	2			194	1	195
Grand Total	502	769	774	424	262	108	90	46	26	13	5	4	3023	16	3039

TABLE 4—*continued*

Test Score by Size of Family for Occupancy Rate

Boys and Girls

Occupancy Rate 3

Test Score	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12+	Total	Unknown	Grand Total
70–6		2				1							3		3
65–9	2	4				1							7		7
60–4	1	20	12	5	6	3	1	2	2				52	1	53
55–9	5	42	30	16	5	10	3		1				112		112
50–4	6	45	47	27	12	8	6	2	3	2			158		158
45–9	7	75	68	42	25	14	14	7	8	3			263	2	265
40–4	11	68	68	36	28	27	9	10	5	6	1	3	272	1	273
35–9	6	47	51	49	40	31	18	8	3	3	3		259	2	261
30–4	6	43	50	35	34	19	12	8	3	7	7	2	226		226
25–9	4	27	45	39	20	29	7	9	3	5	2		190	2	192
20–4	2	31	23	24	27	20	10	11	6	3	1	2	160	3	163
15–9	2	17	25	17	19	19	10	8	3	4		3	127	2	129
10–4	2	16	20	17	10	7	9	6	8	1	1	2	99	1	100
5–9	2	10	11	6	13	17	8	5	3	1	1	1	78	2	80
0–4	2	11	13	4	8	18	2	6	3	3	1	1	72	2	74
YY		1	2	6	1	2	1		1	1			15		15
Total	58	459	465	323	248	226	110	82	52	39	17	14	2093	18	2111
XX	3	29	29	21	21	25	13	15	6	3	2	1	168	1	169
Grand Total	61	488	494	344	269	251	123	97	58	42	19	15	2261	19	2280

Occupancy Rate 4

Test Score	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12+	Total	Unknown	Grand Total
70–6															
65–9		1	1	2									4		4
60–4	2	1	3	7			1						14		14
55–9	1	5	8	18	11	2	2	1		1	2	1	52		52
50–4	4	9	9	25	13	8	5	3					76		76
45–9	1	18	11	35	15	11	10	1		1			103	1	104
40–4	6	15	10	41	27	9	7	9	2	3	3	1	133	1	134
35–9	6	12	18	44	30	17	14	9	4	3	2	3	162	2	164
30–4	5	12	10	38	16	9	13	15	2	2	2	1	125	1	126
25–9	4	10	9	29	30	14	15	8	8	3		1	131		131
20–4	2	15	9	22	11	14	15	7	1	2	2	3	103	1	104
15–9	4	4	13	17	18	14	7	4	6	3	1	2	93		93
10–4	3	5	9	24	12	17	11	10	8	3	4	3	109	3	112
5–9	5	5	7	11	7	6	15	9	5	2	2		74		74
0–4	2	4	4	9	12	5	7	13	1	1		1	59		59
YY	1	1		3	4		1	1	1				12		12
Total	46	117	121	325	206	126	123	90	38	24	18	16	1250	9	1259
XX	5	6	9	26	20	7	11	8	6	5	2	1	106		106
Grand Total	51	123	130	351	226	133	134	98	44	29	20	17	1356	9	1365

TABLE 4—*continued*

Test Score by Size of Family for Occupancy Rate

x=test score in units of five points with origin at 37

Occupancy Rate		*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*
1	n	178	210	105	41	18	11	4*						567	3
	$\sum x$	376	549	207	39	4	−4	−2						1169	
	$\sum x^2$	2320	2839	1381	369	190	260	38						7379	
	Mean Test Score	47·56	50·07	46·86	41·76	38·10	35·18	34·50							
	Overall mean for test score: 47·31														
2	n	464	727	726	398	246	99	81	44	24	11	9*		2829	16
	$\sum x$	390	789	526	−6	−134	−128	−67	−48	−9	−2	−27		1284	
	$\sum x^2$	4626	6785	6829	3307	2630	1273	828	463	189	40	163		27133	
	Mean Test Score	41·20	42·43	40·62	36·92	34·28	30·54	32·86	31·55	35·13	36·09	22·00			
	Overall mean for test score: 39·27														
3	n	58	459	465	323	248	226	110	82	52	39	17	14	2093	19
	$\sum x$	16	177	−55	−154	−258	−343	−138	−153	−81	−63	−31	−40	−1123	
	$\sum x^2$	562	4237	4011	2638	2286	2861	1142	1001	751	411	135	206	20241	
	Mean Test Score	38·38	38·93	36·41	34·62	31·80	29·41	30·73	27·67	29·21	28·92	27·88	22·71		
	Overall mean for test score: 34·32														
4	n	46	117	121	325	206	126	123	90	38	24	18	16	1250	9
	$\sum x$	−67	−74	−110	−195	−255	−228	−262	−246	−127	−51	−33	−35	−1683	
	$\sum x^2$	617	1110	1382	3149	2239	1458	1676	1490	619	299	243	201	14483	
	Mean Test Score	29·72	33·84	32·45	34·00	30·81	27·95	26·35	23·33	20·29	26·38	27·85	26·06		
	Overall mean for test score: 30·27														

* Includes larger sizes of family

TABLE 5

Test Score by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1885-9

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	Unknown	Grand Total
	Size of Family																		
70–6																			
65–9																			
60–4				1													1		1
55–9	1									1							2		2
50–4		1		1			2										4		4
45–9									1								1		1
40–4																			
35–9			2					1									3		3
30–4				1	1		1										3		3
25–9					1	1											2		2
20–4				1													1		1
15–9																			
10–4																			
5–9					1												1		1
0–4																			
YY																			
Total	1	1	2	4	3	1	3	1	1	1							18		18
XX																		1	1
Grand Total	1	1	2	4	3	1	3	1	1	1							18	1	19

Date of Mother's Birth 1890-4

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	Unknown	Grand Total
	Size of Family																		
70–6																			
65–9	1			1													2		2
60–4		1			1												2		2
55–9	2		2	2	2	1	1				2						12		12
50–4	1	1	4	2	2		1	1	1								13		13
45–9	1			1	1	1	2		1		1						8		8
40–4		2	2	3	5	1	3	2	3								21		21
35–9	1		6	3	1	1	3	1	3								19		19
30–4		2	1	1	3	2	2	1	2		1						15		15
25–9		2	1	2	3	3	1		1	2	1						16		16
20–4	1	1	3	2				1	1								9		9
15–9				1		1	2	1	1	1			1				8		8
10–4	1			3			2		1				1				8		8
5–9						1		1	1								3		3
0–4					1	1											2		2
YY						1	1										2		2
Total	8	9	19	21	19	13	18	8	15	3	5		2				140		140
XX		2	2	2	3		1										10	1	11
Grand Total	8	11	21	23	22	13	19	8	15	3	5		2				150	1	151

TABLE 5—*continued*

Test Score by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1895-9

Size of Family

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
70–6	2	1	2														5		5
65–9	2	3	4		1												10		10
60–4	5	11	4	1	2		4										27		27
55–9	5	3	5	8	7	5	2	1	1	1							38		38
50–4	9	10	10	14	8	4		2		2							59		59
45–9	7	10	8	8	9	5	4	3	2	2							58		58
40–4	8	11	14	11	12	3	6	7	1	5	2	1	2				83		83
35–9	2	12	13	20	12	5	3	6	3	1	1						78		78
30–4	3	11	6	8	9	4	6	4		4	1	1					57		57
25–9		7	3	3	7	4	4	3	3	3							37		37
20–4	3	2	2	4	10	5	1	3	1		1	2					34		34
15–9	2	3	5	3	4	4	4	2	2	1		1					31		31
10–4	2	3	3	2	7	6	2	3	3		2			1			34		34
5–9		1	3	1	5	2	10	2			1						25		25
0–4			2	2	6	10	1	3	2	1	1	1					29		29
YY			1	1					1								3		3
Total	50	88	85	86	99	57	47	39	19	20	9	6	2	1			608		608
XX	4	6	9	6	3	6	2	6	5	2	1	1					51	3	54
Grand Total	54	94	94	92	102	63	49	45	24	22	10	7	2	1			659	3	662

Date of Mother's Birth 1900-4

Size of Family

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
70–6	3	3	1	1		1											9		9
65–9	7	14	10	1	1	2											35		35
60–4	15	30	17	8	2	2	1		1								76		76
55–9	14	41	26	13	6	4	2	1									107		107
50–4	22	37	24	16	12	8	6	4	1								130		130
45–9	22	42	45	31	11	6	13	4	6	3	1						184		184
40–4	11	36	28	25	19	12	6	3	4	3							147		147
35–9	9	31	22	37	27	10	16	8	2	2	2		1	2			169		169
30–4	13	18	27	22	12	13	11	13	1	6	4	1				1	142		142
25–9	10	10	18	29	5	12	11	7	4	4	1		1				112		112
20–4	1	8	13	11	6	13	7	3	4	1	1			1	1		70		70
15–9	5	8	12	9	7	8	5	2	2	3	1						62		62
10–4	7	4	15	8	6	8	5	5	5	2	2						67		67
5–9	4	7	1	4	6	7	4	1	2	1	1						38		38
0–4	1	1	7	7	6	5	3	9	2		1				1		43		43
YY		1		2	1		1		1	1							7		7
Total	144	291	266	224	127	111	91	60	35	26	14	1	2	3	2	1	1398		1398
XX	8	12	14	15	16	8	8	4	4	2	2	1					94	7	101
Grand Total	152	303	280	239	143	119	99	64	39	28	16	2	2	3	2	1	1492	7	1499

TABLE 5—*continued*

Test Score by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1905-9

Test Score	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Un-known*	*Grand Total*
70–6	1	4	2														7		7
65–9	4	11	9	2	1												27		27
60–4	22	41	20	5	7	2	1	2									100		100
55–9	30	61	47	15	4	3	2		1								163		163
50–4	28	64	39	27	17	9	3	1									188		188
45–9	30	72	56	36	16	7	5	2									224		224
40–4	25	56	52	38	22	19	9	7	2	1	1		1		1		234		234
35–9	11	46	35	32	24	17	8	5	1	2	2		1				184		184
30–4	11	24	34	30	17	4	8	7	3	1	2						141		141
25–9	6	27	32	32	24	15	5	8	3	2				1			155		155
20–4	2	20	16	16	15	12	8	7	3	2		2					103		103
15–9	7	8	14	14	15	12	3	4	3	2	2		1		2		87		87
10–4	5	10	5	17	10	8	5	3	6	2		2					73		73
5–9	4	8	8	11	6	5	8	6	3	2	1	1					63		63
0–4	1	5	6	4	6	9	1	5									37		37
YY		2	2		2	2	1	1									10		10
Total	187	459	377	279	186	124	67	58	25	14	8	5	3	1	3		1796		1796
XX	15	23	28	20	15	13	9	8	1	2							134	9	143
Grand Total	202	482	405	299	201	137	76	66	26	16	8	5	3	1	3		1930	9	1939

Date of Mother's Birth 1910-14

Test Score	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Un-known*	*Grand Total*
70–6	2	2	1														5		5
65–9	6	4	6	2	1												19		19
60–4	9	22	20	10	2	3		1	1								68		68
55–9	22	46	28	19	6	3	1										125		125
50–4	31	66	55	23	12	2	3		1								193		193
45–9	38	68	73	41	17	11	4	2	2								256		256
40–4	35	59	52	45	20	9	4	3			1						228		228
35–9	22	53	59	39	24	15	10	1	2								225		225
30–4	14	42	39	34	25	9	4	6			1						174		174
25–9	13	36	41	34	17	13	6	1	2								163		163
20–4	10	30	26	34	21	10	12	3		1							147		147
15–9	6	18	23	13	18	10	8	3	2								101		101
10–4	3	7	16	17	8	3	5	2	1		1						63		63
5–9	7	11	12	5	6	8	5	5	3								62		62
0–4	6	8	14	8	13	7	6	5		3							70		70
YY		2	1	4	1	1			1								10		10
Total	224	474	466	328	191	104	68	32	15	4	3						1909		1909
XX	17	32	35	22	17	14	10	3	2	3	1						156	13	169
Grand Total	241	506	501	350	208	118	78	35	17	7	4						2065	13	2078

TABLE 5—*continued*

Test Score by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1915-19

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	Un-known	Grand Total
	Size of Family																		
70–6																			
65–9	2	1															3		3
60–4	1	7	4														12		12
55–9	5	8	13	7	3		1										37		37
50–4	6	14	19	7	4	1											51		51
45–9	8	23	14	18	6	3	2										74		74
40–4	13	20	20	8	8	2	1	1	1								74		74
35–9	14	18	18	17	10	5	1			1							84		84
30–4	9	19	17	11	7	3	1	2				1					70		70
25–9	12	16	20	8	9	2	1	1	1								70		70
20–4	8	8	7	10	6	4		1	1		1						46		46
15–9	2	6	10	5	9	3			1								36		36
10–4	2	9	6	10	3	3	5										38		38
5–9	2	4	4	4	2	3	1										20		20
0–4	3	5	1	1	2	2		1									15		15
YY		2	1	3	3												9		9
Total	87	160	154	109	72	31	13	6	4	1	1	1					639		639
XX	6	10	7	7	3	3	3	1									40	6	46
Grand Total	93	170	161	116	75	34	16	7	4	1	1	1					679	6	685

Date of Mother's Birth 1920 and Later

Test Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	Un-known	Grand Total
	Size of Family																		
70–6																			
65–9																			
60–4		1															1		1
55–9		1															1		1
50–4																			
45–9	2				1												3		3
40–4		1				1											2		2
35–9	1		2														3		3
30–4	1		1														2		2
25–9																			
20–4																			
15–9	1			1	1												3		3
10–4																			
5–9				1		1											2		2
0–4	1	1															2		2
YY	1																1		1
Total	7	4	3	2	2	2											20		20
XX																		2	2
Grand Total	7	4	3	2	2	2											20	2	22

TABLE 5—*continued*

Test Score by Size of Family for Date of Mother's Birth (excluding cases where size of family is not known)

x = test score in units of five points with origin at 37

Date of Mother's Birth		*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*
–1899	n	59	98	106	111	121	71	68	48	35	24	14	11	766
	Σx	105	93	56	30	−77	−137	−72	−61	−56	−6	−18	−29	−172
	Σx^2	735	901	1106	914	1347	1169	900	495	412	168	188	153	4063
	Mean Test Score	45·90	41·74	39·64	38·35	33·82	27·35	31·71	30·64	29·00	35·75	30·57	23·82	
				Overall mean for test score:					35·88					
				Overall variance for test score:					276·12					
1900–4	n	144	291	266	224	127	111	91	60	35	26	14	9	1398
	Σx	193	480	166	−25	−66	−132	−88	−111	−63	−43	−34	17	260
	Σx^2	1805	3302	2836	1952	1260	1346	832	773	491	229	172	65	15063
	Mean Test Score	43·70	45·25	40·12	36·44	34·40	31·00	32·17	27·75	28·00	28·73	24·86	27·56	
				Overall mean for test score:					37·93					
				Overall variance for test score:					268·69					
1905–9	n	187	459	377	279	186	124	67	58	25	14	8	12	1796
	Σx	317	618	306	−89	−150	−183	−100	−129	−66	−40	−15	−34	435
	Σx^2	2103	4834	3636	2405	1860	1509	772	825	354	182	71	158	18709
	Mean Test Score	45·48	43·73	41·06	35·41	32·97	29·62	29·54	25·88	23·80	22·71	27·62	22·83	
				Overall mean for test score:					38·13					
				Overall variance for test score:					259·10					
1910–14	n	224	474	466	328	191	104	68	32	15	4	3		1909
	Σx	193	278	70	−121	−238	−160	−156	−92	−30	−24	−5		−285
	Σx^2	2230	4258	4424	2919	2050	1260	926	596	264	156	27		19110
	Mean Test Score	41·31	39·93	37·75	35·16	30·77	29·31	25·53	22·62	27·00				
				Overall mean for test score:					35·71					
				Overall variance for test score:					249·84					
1915+	n	94	164	157	111	74	33	13	6	4	1	1	1	659
	Σx	−39	−33	−10	−76	−99	−72	−25	−13	−7	0	−3	−1	−378
	Σx^2	828	1631	1268	1110	769	436	191	65	30	0	9	1	6338
	Mean Test Score	34·93	35·99	36·68	33·58	30·31	26·09	27·38	26·17					
				Overall mean for test score:					34·13					
				Overall variance for test score:					232·57					

TABLE 6

Test Score by Father's Occupation for Occupancy Rate

Boys and Girls

Occupancy Rate 1

Test Score	*Father's Occupation* 10, 20	30	41, 42	51, 52	61	62, 6x	63	70	80	*Total*	*Un-known*	*Grand Total*
70–6	7	3		1						11		11
65–9	12	4	6	2	5		1	2		32	1	33
60–4	32	8	15	8	4		1	2	4	74	3	77
55–9	32	11	11	18	11			4	1	88	1	89
50–4	19	14	13	7	16	5	1	4	3	82	2	84
45–9	12	9	13	9	14		2	6	2	67	3	70
40–4	13	7	6	8	16	2	1	6	4	63		63
35–9	4	5	4	2	8	1	4	6	3	37		37
30–4	2	2	4	4	6	1	1	7		27	2	29
25–9	4	3	2	2	5		1	5	3	25	2	27
20–4	1	2		1	1		1	3	6	15		15
15–9		2			3	1	2	4	1	13		13
10–4	1	1					1	2	1	6	1	7
5–9		1		1	2	1		2	2	9		9
0–4		1	1			1				3		3
YY							1		1	2		2
Total	139	73	75	63	91	12	17	53	31	554	15	569
XX	12	3	7	3	6		1	2	7	41		41
Grand Total	151	76	82	66	97	12	18	55	38	595	15	610

Occupancy Rate 2

Test Score	*Father's Occupation* 10, 20	30	41, 42	51, 52	61	62, 6x	63	70	80	*Total*	*Un-known*	*Grand Total*
70–6	3	1	1	2	4					11	1	12
65–9	7	3	7	11	17	2	4		4	55		55
60–4	4	9	14	32	64	10	10	4	3	150	2	152
55–9	12	17	21	36	95	19	21	7	14	242	5	247
50–4	10	31	25	48	117	49	25	4	18	327	8	335
45–9	7	26	19	49	158	46	42	13	24	384	7	391
40–4	9	22	19	39	128	50	42	8	22	339	7	346
35–9	8	23	9	30	115	50	44	8	29	316	12	328
30–4	4	10	1	21	86	51	44	7	24	248	6	254
25–9	3	11	4	19	86	34	36	7	16	216	12	228
20–4	4	5	3	9	50	29	28	5	15	148	5	153
15–9	1	8		1	36	19	23	8	15	111	1	112
10–4		1	2	4	25	19	14	3	12	80	3	83
5–9		3	1	1	20	6	15	3	11	60	1	61
0–4				4	18	18	14		14	68	2	70
YY			1		4	3	3		3	14	3	17
Total	72	170	127	306	1023	405	365	77	224	2769	75	2844
XX	5	8	11	20	73	30	23	1	21	192	3	195
Grand Total	77	178	138	326	1096	435	388	78	245	2961	78	3039

TABLE 6—*continued*

Test Score by Father's Occupation for Occupancy Rate

Boys and Girls

Occupancy Rate 3

Test Score	*Father's Occupation* 10, 20	30	41, 42	51, 52	61	62, 6x	63	70	80	*Total*	*Un-known*	*Grand Total*
70–6				1	1		1			3		3
65–9		1			4	1	1			7		7
60–4	1	1	1	4	28	12	4		2	53		53
55–9	1	7	4	12	52	14	16		3	109	3	112
50–4	2	8	1	9	81	29	21	3	3	157	1	158
45–9	2	4	4	25	110	59	42		16	262	3	265
40–4		6	4	14	120	65	44	1	16	270	3	273
35–9	1	11	4	25	89	57	52	1	17	257	4	261
30–4		8	3	14	73	53	51	1	19	222	4	226
25–9	1	5	3	13	76	44	33	2	13	190	6	196
20–4		3	4	11	46	33	42	1	15	155	4	159
15–9		3	3	6	46	29	33	1	6	127	2	129
10–4		3		2	36	20	30		6	97	3	100
5–9		1		5	31	22	17	1	2	79	1	80
0–4		2		1	23	17	23	1	5	72	2	74
YY			1		5	2	7			15		15
Total	8	63	32	142	821	457	417	12	123	2075	36	2111
XX		1	2	12	55	40	45		11	166	3	169
Grand Total	8	64	34	154	876	497	462	12	134	2241	39	2280

Occupancy Rate 4

Test Score	*Father's Occupation* 10, 20	30	41, 42	51, 52	61	62, 6x	63	70	80	*Total*	*Un-known*	*Grand Total*
70–6		1		1	1	1				4		4
65–9		1		1	4	5	2		1	14		14
60–4		2		6	12	19	11		2	52		52
55–9		2		3	32	17	16		4	74	2	76
50–4		3	1	7	39	16	34		3	103	1	104
45–9		4		6	54	35	29		3	131	3	134
40–4		4		6	71	38	40		4	163	1	164
35–9		4		4	48	25	33		10	124	2	126
30–4	1	2		6	39	42	33		4	127	4	131
25–9				5	38	27	25		7	102	2	104
20–4		1		1	34	28	23		3	90	3	93
15–9		1			36	27	41		6	111	1	112
10–4		1			26	15	29		2	73	1	74
5–9		1			18	16	15	1	6	57	2	59
0–4					4	3	3		1	11	1	12
YY												
Total	1	27	1	46	456	314	334	1	56	1236	23	1259
XX		1		1	34	27	34		6	103	3	106
Grand Total	1	28	1	47	490	341	368	1	62	1339	26	1365

P

TABLE 6—*continued*

Test Score by Occupational Class for Occupancy Rate

x = test score in units of five points with origin at 37

Occupancy Rate		*Occupational Class* 1	2	3	4	5	6	7	8	9	*Total*
1	n	139	73	75	63	91	12	17	53	31	554
	Σx	485	156	211	161	143	−1	−7	4	−11	1141
	Σx^2	2371	1010	1003	773	827	149	199	492	383	7207
	Mean Test Score	54·45	47·68	51·07	49·78	44·86	36·58	34·94	40·77	35·23	
		Overall mean for test score: 47·30									
		Overall variance for test score: 219·62									
2	n	72	170	127	306	1023	405	365	77	224	2769
	Σx	158	203	294	521	674	−133	−212	−7	−187	1311
	Σx^2	886	1419	1486	3063	9620	3773	3696	699	2715	27357
	Mean Test Score	47·97	42·97	48·75	45·51	40·29	35·36	34·10	32·45	32·83	
		Overall mean for test score: 39·37									
		Overall variance for test score: 241·48									
3	n	8	63	32	142	821	457	417	12	123	2075
	Σx	17	3	−4	22	147	−329	−549	−15	−112	−1114
	Σx^2	71	579	266	1076	7929	4335	4763	147	974	20140
	Mean Test Score	47·62	37·24	36·37	44·75	37·89	33·49	30·42	30·75	32·45	
		Overall mean for test score: 39·68									
		Overall variance for test score: 235·56									
4	n	1	27	1	46	456	314	334	1	56	1236
	Σx	−2	5	2	29	−564	−435	−572	−7	−108	−1652
	Σx^2	4	265	4	307	4830	3747	4244	49	810	14260
	Mean Test Score		37·93		40·15	30·82	30·07	28·44		27·36	
		Overall mean for test score: 30·32									
		Overall variance for test score: 284·05									

TABLE 7

Test Score by Father's Occupation for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1899 and Earlier

Father's Occupation

Test Score	10	20	30	41	42	51	52	61	62	6x	63	70	80	*Total*	*Unknown*	*Grand Total*
70–6	3		1					1						5		5
65–9	2	2		2		1		2			3			12		12
60–4	1	1	3	2	1		5	9	1		3	1	2	29	1	30
55–9	3	2	6	3		3	7	15	3		4	1	3	50	2	52
50–4	3	3	8	5	1	2	5	21	8	1	12	2	3	74	3	77
45–9	2	1	5	5		1	4	16	9	4	11	3	5	66	1	67
40–4	2			2	2	3	5	39	17	2	19	2	11	104		104
35–9	2	1	7	1		2	8	27	17	8	18	2	7	100		100
30–4			3				5	17	20	7	14	3	7	76	1	77
25–9		1	1			1	5	21	8	2	9		4	52	3	55
20–4			1				1	8	9	1	15	2	8	45		45
15–9			1	1				10	5	2	14	3	4	40		40
10–4							1	10	12	3	11		6	43		43
5–9			1					10	6		9		3	29		29
0–4			1				1	9	4	1	10		4	30	1	31
YY									2		3			5		5
Total	18	11	38	21	4	13	47	215	121	31	155	19	67	760	12	772
XX	2		1	1	1	1	5	22	7	2	10	1	7	60	1	61
Grand Total	20	11	39	22	5	14	52	237	128	33	165	20	74	820	13	833

Date of Mother's Birth 1900-4

Father's Occupation

Test Score	10	20	30	41	42	51	52	61	62	6x	63	70	80	*Total*	*Unknown*	*Grand Total*
70–6	4		2			1		1						8	1	9
65–9	5	1	5	5	1	3	1	8			1	2	2	34	1	35
60–4	13	3	7	5	1	4	5	22	2	3	5	3	2	75	1	76
55–9	9	6	7	12		8	8	29	8		7	3	8	105	3	108
50–4	5	2	11	4	1	4	12	48	18	5	13	1	5	129	1	130
45–9	1		14	10	4	3	13	65	30	5	25	3	9	182	4	186
40–4	4	2	13	3	3	4	9	54	21	6	19	2	6	146	1	147
35–9	1	3	7	8		4	13	52	27	3	33	4	13	168	3	171
30–4	2	4	7	3		3	7	39	23	4	33	7	11	143		143
25–9	1	1	6	3			4	44	13	4	23	2	8	109	5	114
20–4		1	4	2	2		2	17	19		16	1	5	69	1	70
15–9			3				2	16	19	2	14	1	5	62		62
10–4		1	1			1	3	18	7	5	18	4	6	64	3	67
5–9			1				1	12	6	3	7	2	5	37	1	38
0–4				1			1	13	10	1	11		7	44		44
YY								2	2	1	1			6	1	7
Total	45	24	88	56	12	35	81	440	205	42	226	35	92	1381	26	1407
XX	1	1	4	4	1	3	3	32	10	2	22		8	91	1	92
Grand Total	46	25	92	60	13	38	84	472	215	44	248	35	100	1472	27	1499

TABLE 7—*continued*

Test Score by Father's Occupation for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1905-9

Father's Occupation

Test Score	10	20	30	41	42	51	52	61	62	6x	63	70	80	*Total*	*Unknown*	*Grand Total*
70–6		2		1			2	1			1			7		7
65–9	6	1	2	3	1	2	2	8	1				1	27		27
60–4	10	3	6	17	1	11	9	31	6		2	2	2	100	1	101
55–9	13	3	10	9	1	6	19	70	10	4	13	2	3	163	2	165
50–4	7	3	15	12	1	8	10	74	24	8	11	4	8	185	3	188
45–9	7	3	8	9	1	8	23	99	17	7	23	6	12	223	1	224
40 4	4	3	9	9	2	6	9	92	30	16	35	6	10	231	3	234
35–9	1	1	11	3			13	84	23	7	20	6	13	182	4	186
30–4		1	4	3		3	12	56	21	5	26	2	8	141	2	143
25–9	1	1	4	3		2	7	52	23	11	30	7	10	151	4	155
20–4	1	1	2			2	7	41	18	5	18	1	6	102	1	103
15–9		1	5				1	27	17	3	17	5	11	87		87
10–4			3					31	11	1	21		4	71	2	73
5–9			3			1	1	21	10	3	18	2	3	62	1	63
0–4			3				1	7	7	2	9	2	6	37		37
YY				1				2	1		3		3	10		10
Total	50	23	85	70	7	49	116	696	219	72	247	45	100	1779	24	1803
XX	6	4	2	9	1	3	6	35	24	8	23	1	13	135	1	136
Grand Total	56	27	87	79	8	52	122	731	243	80	270	46	113	1914	25	1939

Date of Mother's Birth 1910-14

Father's Occupation

Test Score	10	20	30	41	42	51	52	61	62	6x	63	70	80	*Total*	*Unknown*	*Grand Total*
70–6	1		1				1	2						5		5
65–9	2		2				2	7	2	1	2		1	19		19
60–4	3	1	3	2		3	6	26	13	1	7		3	68	1	69
55–9	4	2	9	9	2	4	12	42	13	3	16	2	5	123	2	125
50 -4	7		17	11	1	6	20	77	23	3	16	2	7	190	4	194
45–9	4	2	15	3	2	4	22	104	28	7	42	5	14	252	5	257
40–4	2	4	13	5	2	5	16	100	30	13	23	3	12	228	3	231
35 -9		2	14	4	1	4	13	91	33	6	36	2	13	219	6	225
30–4			7	1	1	5	1	70	26	7	36	1	16	171	3	174
25–9		1	9	3		3	13	57	28	10	24	5	6	159	4	163
20 4			1	1	1	1	8	53	20	8	34	2	15	144	5	149
15–9			3	1	1		3	44	15	6	23	1	4	101		101
10–4			1	1	1	1		24	13	1	19		2	63	2	65
5 -9							2	27	9	3	20	1	1	63		63
0–4							2	25	17	4	14		6	68	3	71
YY				1				4	1		2		2	10		10
Total	23	12	95	42	12	36	121	753	271	73	314	24	107	1883	38	1921
XX			2	3		2	11	66	23	4	32	1	11	155	2	157
Grand Total	23	12	97	45	12	38	132	819	294	77	346	25	118	2038	40	2078

TABLE 7—*continued*

TEST SCORE BY FATHER'S OCCUPATION FOR DATE OF MOTHER'S BIRTH

Boys and Girls

Date of Mother's Birth 1915 and Later

Test Score	10	20	30	41	42	51	52	61	62	6x	63	70	80	*Total*	*Unknown*	*Grand Total*
							Father's Occupation									
70–6						1		2						3		3
65–9	1						2	8	1				1	13		13
60–4		1	1				4	11	9	2	8	1	1	38		38
55–9	1		3	2			2	21	4	4	8	1	2	48	3	51
50–4			1	2		3	5	33	9	1	17	1	3	75	2	77
45–9			3	1			7	26	13	2	15	1	5	73	5	78
40–4			3				5	26	16	4	28		7	89		89
35–9						2	4	26	8	4	16	1	7	68	5	73
30–4	2		1				2	28	11	7	14		2	67	3	70
25–9	1			1			5	15	7	1	9		7	46		46
20–4			1				2	19	3		10	2		37	3	40
15–9			1					11	7	2	12		6	39		39
10–4				1		1	1	7	4		5		3	22	1	23
5–9								3	4		7			14	2	16
0–4								3	2		4			9	1	10
YY																
Total	5	1	14	7		7	39	239	98	27	153	7	44	641	25	666
XX			3				1	8	12	1	12		3	40	1	41
Grand Total	5	1	17	7		7	40	247	110	28	165	7	47	681	26	707

TABLE 7—*continued*

Test Score by Occupational Class for Date of Mother's Birth

x = test score in units of five points with origin at 37

Date of Mother's Birth		Occupational Class 1	2	3	4	5	6	7	8	9	Total
– 1899	n	29	38	25	60	215	152	155	19	67	760
	Percentage	3·8	5·0	3·3	7·9	28·3	20·0	20·4	2·5	8·8	100
	Σx	99	55	67	78	–38	176	–207	2	–79	–199
	Σx^2	493	429	289	524	2262	1330	1916	142	769	8154
	Mean Test Score	54·1	44·2	50·4	43·5	36·1	31·2	30·3	32·0	37·5	
	Overall mean for test score: 35·71										
	Overall variance for test score: 262·73										
1900–4	n	69	88	68	116	440	247	226	35	92	1381
	Percentage	5·0	6·4	4·9	8·4	31·9	17·9	16·4	2·5	6·7	100·1
	Σx	215	127	135	168	100	–191	–232	0	–78	244
	Σx^2	1173	909	765	1156	4338	2539	2292	430	1178	14780
	Mean Test Score	52·6	44·2	46·9	44·2	38·1	33·1	31·9	37·0	32·8	
	Overall mean for test score: 37·90										
	Overall variance for test score: 266·97										
1905–9	n	73	85	77	165	696	291	247	45	100	1779
	Percentage	4·1	4·8	4·3	9·3	39·1	16·3	13·9	2·5	5·6	99·9
	Σx	227	60	215	286	267	–169	–322	–17	–105	442
	Σx^2	1111	1006	1035	1712	6423	2787	2874	437	1191	18576
	Mean Test Score	52·5	40·5	50·4	45·7	38·9	34·1	30·5	35·1	31·7	
	Overall mean for test score: 38·24										
	Overall variance for test score: 259·50										
1910–14	n	35	95	54	157	753	344	314	24	107	1883
	Percentage	1·9	5·0	2·9	8·3	40·0	18·3	16·7	1·3	5·7	100·1
	Σx	100	119	68	171	–111	230	–339	0	–59	–281
	Σx^2	414	691	524	1355	7353	3764	3623	164	1039	18927
	Mean Test Score	51·3	43·3	43·3	42·4	36·3	33·7	31·6	37·0	34·2	
	Overall mean for test score: 36·30										
	Overall variance for test score: 250·86										
1915 +	n	6	14	7	46	239	125	153	7	44	641
	Percentage	0·9	2·2	1·1	7·2	37·3	19·5	23·9	1·1	6·9	100·1
	Σx	5	7	2	16	–91	–87	–173	1	–54	–374
	Σx^2	67	95	72	370	2193	1195	1615	63	412	6082
	Mean Test Score	41·2	39·5	38·4	38·7	35·1	33·5	31·3	37·7	30·9	
	Overall mean for test score: 34·08										
	Overall variance for test score: 229·05										

DISTRIBUTION OF HEIGHT

TABLE 8

Height by Month of Birth for Month of Measurement

(*a*) Boys

Measured in May 1947

Height in inches	*Month of Birth*												
	Jan	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +													
68–9													
66–7													
64–5													
62–3						1							1
60–1	2					2				2			6
58–9	2	1	2	3	2	2	1	2		1			16
56–7	1	6	5	1	4	3	6	4	6		3	2	41
54–5	5	7	2	7	3	4	3	8	4	7	2	4	56
52–3	1	6	4	4	4	5	3	2	2	5	2	4	42
50–1	1		1			1	2	1		1	3	4	14
48–9						2		1	1	1			5
46–7						1							1
44–5													
42–3													
41 –													
Unknown								1					1
Total	12	20	14	15	13	21	15	19	13	17	10	14	183

Measured in June 1947

Height in inches	*Month of Birth*												
	Jan	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +		1			1	2							4
68–9				1									1
66–7													
64–5	1												1
62–3				1		2			1			1	5
60–1	4	1	6	1	3	2	4	3	3	2			29
58–9	16	14	23	15	23	9	11	17	11	6	8	6	159
56–7	46	47	51	48	58	38	43	32	24	24	26	19	456
54–5	71	59	66	71	71	61	64	64	61	54	46	49	737
52–3	49	49	63	60	65	61	48	66	47	72	69	54	703
50–1	25	17	20	15	27	39	30	30	30	34	29	43	339
48–9	3	8	5	5	2	6	8	7	7	10	13	9	83
46–7	1			1	2	1	3	2	1	4	6	1	22
44–5	1			1	1		1	1			2	1	8
42–3			1	1		1		1				1	5
41 –												1	1
Unknown	1	3	3	1	1		3	3		3		2	20
Total	218	199	238	221	254	222	215	226	185	209	199	187	2573

TABLE 8—*continued*

Height by Month of Birth for Month of Measurement

(*a*) Boys

Measured in July 1947

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
70 +													
68–9													
66–7													
64–5													
62–3								1					1
60–1	2	1				1	2	1					7
58–9	2	3	1	2	1		3	1			1	1	15
56–7	6	10	3	4	6	4	6	2	2	2	2	4	51
54–5	9	9	5	9	11	4	8	8	3	4	6	5	81
52–3	10	10	10	4	11	11	4	8	10	8	12	6	104
50–1	3	4	5	2	7	4	5	5	3	6	9	2	55
48–9	1	2	2	1	2	2	1	2	2	3	1	1	20
46–7					1				2				3
44–5				1									1
42–3													
41 –													
Unknown				1	1			1					3
Total	33	39	26	24	40	26	29	29	22	23	31	9	341

Measured in August 1947

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
70 +													
68–9													
66–7													
64–5													
62–3													
60–1													
58–9									1				1
56–7						3	2						5
54–5				3	1								4
52–3													
50–1													
48–9													
46–7													
44–5													
42–3													
41 –													
Unknown													
Total				3	1	3	2		1				10

TABLE 8—*continued*

HEIGHT BY MONTH OF BIRTH FOR MONTH OF MEASUREMENT

(*a*) Boys

Measured in September 1947

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
70 +													
68–9													
66–7													
64–5													
62–3		1											1
60–1			1	1									2
58–9	2	2	3					1	3		1	2	14
56–7	3	2	4	2	2	4	3	2			5	1	28
54–5	5	1	5	3	2		2	1	2	4	4	3	32
52–3	5	6	1	5		6	2	2	1	1	2	1	32
50–1	1			1	1	1	1	1	1	1	1	1	10
48–9			1	1		1			1		1		5
46–7													
44–5													
42–3													
41 –													
Unknown													
Total	16	12	15	13	5	12	8	7	8	6	14	8	124

Measured in October 1947

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
70 +													
68–9													
66–7													
64–5													
62–3													
60–1													
58–9					1		1						2
56–7	1		1					1		1	1		5
54–5	1			1	1					2		1	6
52–3		4	1	1				2					8
50–1				1	2							1	4
48–9											1		1
46–7													
44–5													
42–3													
41 –													
Unknown													
Total	2	4	2	3	4		1	3		3	2	2	26

TABLE 8—*continued*

Height by Month of Birth for Month of Measurement

(*a*) Boys

Measured in November 1947

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +													
68–9													
66–7													
64–5													
62–3													
60–1												1	1
58–9	1								1			1	3
56–7			1	1			1		2	1	1		7
54–5			2		1	1	1	1			2		8
52–3			1	1	1			2			1		6
50–1			1								1		2
48–9													
46–7													
44–5													
42–3													
41 –													
Unknown	2		1	1		1	1		3		1	1	11
Total	3		6	3	2	2	3	3	6	1	6	3	38

Measured in December 1947

NONE

TABLE 8—*continued*

Height by Month of Birth for Month of Measurement

(a) Boys

Measured in January 1948

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +													
68–9													
66–7													
64–5													
62–3													
60–1	1		1										2
58–9													
56–7				1		2		1			1	1	6
54–5		1	1	4	2	3	3	1			1		16
52–3			2					1			1	1	5
50–1							1	2		1			4
48–9						2							2
46–7											1		1
44–5													
42–3													
41 –													
Unknown													
Total	1	1	4	5	2	7	4	5		1	4	2	36

Measured in February 1948

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +													
68–9													
66–7													
64–5		1											1
62–3													
60–1					1								1
58–9										1			1
56–7											1	2	3
54–5				1	1					1	1		4
52–3							2						2
50–1													
48–9													
46–7							1						1
44–5													
42–3													
41 –													
Unknown													
Total		1		1	2		3			2	2	2	13

TABLE 8—*continued*

Height by Month of Birth for Month of Measurement

(*a*) Boys

Measured in March 1948

Height in inches	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +													
68–9													
66–7													
64–5						1							1
62–3									1				1
60–1		1	1	2	I						1		6
58–9	2	2	2					3	1				10
56–7	2		1	1	4		2	2		2	3	3	20
54–5	1		2		2	2	1	1	6	1	2	1	19
52–3	1		1		2	1			3	4	3	4	19
50–1			1		2				1		1	1	6
48–9						1	1	1					3
46–7										1			1
44–5													
42–3													
41 –													
Unknown													
Total	6	3	8	3	11	5	4	7	12	8	10	9	86

Measured in April 1948

Height in inches	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +													
68–9													
66–7											1		1
64–5													
62–3	1												1
60–1				1									1
58–9	2			1						1			4
56–7	1	1	1				1		1		1		6
54–5				1				1				2	4
52–3					1			1		1	1	1	5
50–1													
48–9													
46–7													
44–5													
42–3													
41 –													
Unknown													
Total	4	1	1	3	1		1	2	1	2	3	3	22

TABLE 8—*continued*

Height by Month of Birth for Month of Measurement

(*a*) Boys

Measured in May 1948

Month of Birth

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +													
68–9													
66–7													
64–5													
62–3			1							1			2
60–1										2			2
58–9					1				2				3
56–7	1				1								2
54–5													
52–3		1											1
50–1													
48–9								1					1
46–7													
44–5													
42–3													
41 –													
Unknown													
Total	1	1	1		2			1	2	3			11

Month of Measurement Unknown

Month of Birth

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +												1	1
68–9													
66–7													
64–5													
62–3													
60–1	1					2							3
58–9			1	2		2							5
56–7		1				1			2		1		5
54–5	1				1	1					2	1	6
52–3	1	1	1				1	3			1		8
50–1								1	1	1		2	5
48–9												1	1
46–7													
44–5													
42–3													
41 –													
Unknown	14	12	16	17	11	16	11	20	11	14	15	19	176
Total	17	14	18	19	12	22	12	24	14	15	19	24	210

TABLE 8—*continued*

HEIGHT BY MONTH OF BIRTH FOR MONTH OF MEASUREMENT

(*b*) Girls

Measured in May 1947

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
70 +													
68–9													
66–7													
64–5													
62–3													
60–1		1		1		2					1		5
58–9	1	1	1	2	1	4	1	3	1			1	16
56–7	7	3	3	5	6	1	5		2	3		4	39
54–5	4	2	3	6	3	3	2	6	3	6	2	2	42
52–3	2	6	2	5	1	7	3	3	2	6	4	1	42
50–1	1	1	1	1	1	1	1	1	1			1	10
48–9		1	1		1	1		1					5
46–7								1	1	2			4
44–5													
42–3													
41 –													
Unknown													
Total	15	15	11	20	13	19	12	15	10	17	7	9	163

Measured in June 1947

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
70 +	1			1							1		3
68–9													
66–7								2					2
64–5		1				1					1		3
62–3		3	1	2	1	3	1	1	1				13
60–1	9	8	6	3	3	1	5	5	1		1	2	44
58–9	12	24	14	19	14	14	13	17	5	6	5	3	146
56–7	41	36	39	32	49	28	20	37	27	27	18	27	381
54–5	73	54	62	82	70	58	71	64	45	54	48	56	737
52–3	56	54	57	62	65	74	67	56	45	68	78	71	753
50–1	24	34	25	39	36	30	38	31	33	42	40	48	420
48–9	6	7	8	5	8	7	11	17	11	19	15	20	134
46–7	1	2	1	1	1	2		1	1	2	4	4	20
44–5		1	1			1		1	1	2		1	8
42–3					1	1	1						3
41 –											2		2
Unknown		1	1	1			1	1	1	2	2	2	12
Total	223	225	215	247	248	220	228	233	171	222	215	234	2681

TABLE 8—*continued*

Height by Month of Birth for Month of Measurement

(*b*) Girls

Measured in July 1947

Height in inches	*Month of Birth* Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
70 +													
68–9													
66–7									1				1
64–5													
62–3						1							1
60–1	2						1	2					5
58–9	3	3	2	1	5	3	2	3	1			1	24
56–7	6	5	6	6	4	7	7	2	5	2			50
54–5	12	8	7	6	7	10	11	5	5	5	3	5	84
52–3	8	6	9	13	7	6	11	11	7	5	6	7	96
50–1	3	2	7	5	3	1	4	2	7	3	4	5	46
48–9			2			3	4	1	2	1	4	2	19
46–7			1						2				3
44–5		1				1							2
42–3													
41 –													
Unknown	1					1							2
Total	35	25	34	31	26	33	40	26	30	16	17	20	333

Measured in August 1947

Height in inches	*Month of Birth* Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
70 +													
68–9													
66–7													
64–5													
62–3													
60–1													
58–9		1	2										3
56–7			1			1		1					3
54–5			1	1						1	1		4
52–3		1		1								1	3
50–1										2	1		3
48–9											1		1
46–7													
44–5													
42–3													
41 –													
Unknown													
Total		2	4	2		1		1		3	3	1	17
Q													

TABLE 8—*continued*

Height by Month of Birth for Month of Measurement

(*b*) Girls

Measured in September 1947

Height in inches	*Month of Birth*												
	Jan	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +													
68–9													
66–7													
64–5													
62–3													
60–1	1			1	1		1		2		1	1	8
58–9	2	1	1	2	3	2	1						12
56–7	1	4	2	4	3	2	2		2	1		2	23
54–5	1	3	3	2	1	6	4	4	2	1	1	2	30
52–3	6	2	2	3	4	3	3	5	2	2	5	2	39
50–1		2	2	1	1		1		3	3	1	3	17
48–9	1	1		1		1	1			2	1		8
46–7				1		1		1					3
44–5								1					1
42–3	1										1		2
41 –													
Unknown													
Total	13	13	10	15	13	15	13	11	11	9	10	10	143

Measured in October 1947

Height in inches	*Month of Birth*												
	Jan	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +													
68–9													
66–7													
64–5													
62–3													
60–1							1		1				2
58–9	1							1					2
56–7				1		1	1		1	1			5
54–5			1	1		1	1		1	1		1	7
52–3	1		2	1	1		2	3			1		11
50–1							2		1		1		4
48–9								1	1				2
46–7													
44–5													
42–3													
41 –													
Unknown													
Total	2		3	3	1	2	7	5	5	2	2	1	33

TABLE 8—*continued*

HEIGHT BY MONTH OF BIRTH FOR MONTH OF MEASUREMENT

(*b*) Girls

Measured in November 1947

Height in inches	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +													
68–9													
66–7													
64–5													
62–3		1											1
60–1					1								1
58–9		1	1				1						3
56–7				1		1	1	2		2			7
54–5			1	1	2							3	7
52–3	1			1			1		1		1		5
50–1													
48–9							1				1		2
46–7													
44–5													
42–3													
41 –													
Unknown	2	2		1	3	2			1		1		12
Total	3	4	2	4	6	3	4	2	2	2	3	3	38

Measured in December 1947

Height in inches	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
70 +													
68–9													
66–7													
64–5													
62–3													
60–1													
58–9													
56–7													
54–5			1										1
52–3													
50–1													
48–9			1										1
46–7													
44–5													
42–3													
41 –													
Unknown													
Total			2										2

TABLE 8—*continued*

Height by Month of Birth for Month of Measurement

(*b*) Girls

Measured in January 1948

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
							Month of Birth						
70 +													
68–9													
66–7													
64–5													
62–3													
60–1			1		1								2
58–9						1						1	2
56–7			1				1	1		1	1	3	8
54–5	2						2	1		1	2	3	11
52–3	1		1				1	3	3	1	1	2	13
50–1		1			1					2	1	1	6
48–9													
46–7												1	1
44–5													
42–3													
41 –													
Unknown													
Total	3	1	·3		2	1	4	5	3	5	5	11	43

Measured in February 1948

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
							Month of Birth						
70 +													
68–9													
66–7													
64–5													
62–3													
60–1												1	1
58–9							1			2			3
56–7		1	1				1						3
54–5				1			1		1				3
52–3	1			1									2
50–1													
48–9													
46–7													
44–5													
42–3													
41 –													
Unknown													
Total	1	1	1	2			3		1	2		1	12

TABLE 8—*continued*

Height by Month of Birth for Month of Measurement

(*b*) Girls

Measured in March 1948

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
							Month of Birth						
70 +													
68–9			1										1
66–7													
64–5													
62–3			2				1						3
60–1	1				2					1			4
58–9			2	2	1			1		1		1	8
56–7			2		2			4	1	4		3	16
54–5	1	1	2	1	2	2	1	1	2	1	2	2	18
52–3	1		1	1		2	1	3	1		5	2	17
50–1					2					1			3
48–9													
46–7													
44–5									1				1
42–3													
41 –													
Unknown												1	1
Total	3	1	10	4	9	4	3	9	5	8	7	9	72

Measured in April 1948

Height in inches	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
							Month of Birth						
70 +													
68–9													
66–7													
64–5													
62–3				1						1			2
60–1													
58–9			1			1	1		1		1	1	6
56–7			1							1		1	3
54–5		1	1		2			1				2	7
52–3			1			1				1		2	5
50–1							2		1				3
48–9													
46–7													
44–5													
42–3													
41 –													
Unknown		1					1			1			3
Total		2	4	1	2	2	4	1	2	4	1	6	29

TABLE 8—*continued*

Height by Month of Birth for Month of Measurement

(*b*) Girls

Measured in May 1948

Height in inches	*Month of Birth* Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
70 +													
68–9													
66–7													
64–5													
62–3													
60–1													
58–9		1				1							2
56–7								1					1
54–5		1								1			2
52–3									1		1		2
50–1													
48–9													
46–7													
44–5													
42–3													
41 –													
Unknown													
Total		2				1		1	1	1	1		7

Month of Measurement Unknown

Height in inches	*Month of Birth* Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
70 +													
68–9													
66–7													
64–5													
62–3		1											1
60–1							1				1		2
58–9								3					3
56–7			1			2		2	1	1	3		10
54–5	1	1			1	1	1		1				6
52–3		1			2	1	1		2		2	2	11
50–1			1	2	1		1					2	7
48–9							1	1	1			2	5
46–7													
44–5													
42–3													
41 –						1							1
Unknown	4	8	8	2	12	2	9	9	6	5	7	15	87
Total	5	11	10	4	16	7	14	15	11	6	13	21	133

TABLE 9

Height by Age at Date of Measurement

(a) Boys

Height in inches	Age in Months											
	125½	126½	127½	128½	129½	130½	131½	132½	133½	134½	135½	136½
70 +								2	1			1
68–9										1		
66–7												
64–5												
62–3		1			1		2	2		1		
60–1			2	2	3	3	8	4	4	1	6	4
58–9		6	10	7	15	19	16	17	27	19	27	18
56–7	2	22	30	32	32	48	48	51	69	68	69	57
54–5	4	51	58	64	76	75	81	80	82	88	86	76
52–3	4	56	80	86	58	81	62	71	83	80	85	64
50–1	4	45	32	44	38	37	37	46	32	24	25	25
48–9		9	15	12	11	11	12	7	4	7	7	12
46–7		1	6	4	1	4	4	1	2	3		
44–5		1	2			1	1		1	1	1	
42–3		1				1		1		1	1	
41 –		1										
Total	14	194	235	251	235	280	271	282	305	294	307	257
Unknown		2		3	1	3	5	1	1	5	4	4
Grand Total	14	196	235	254	236	283	276	283	306	299	311	261

Height in inches	Age in Months—continued											Total
	137½	138½	139½	140½	141½	142½	143½	144½	145½	146½	147½	
70 +												4
68–9												1
66–7	1											1
64–5	1				1			1				3
62–3		1	2							1	1	12
60–1	6	3	2		1	2	2	3	1			57
58–9	20	7	5	4		1		4	2	2	2	228
56–7	62	10	9	6	3	4	1	2	1	3	1	630
54–5	87	26	5	11	8	4	1	3		1		967
52–3	70	17	10	11	1	4	1	1		1	1	927
50–1	34	6		2		2		1				434
48–9	6	1	3	1	2							120
46–7	2		1									29
44–5	1											9
42–3												5
41 –												1
Total	290	71	37	35	16	17	5	15	4	8	5	3428
Unknown	2		1	1		2						35
Grand Total	292	71	38	36	16	19	5	15	4	8	5	3463

TABLE 9—*continued*

Height by Age at Date of Measurement

(*b*) Girls

Height in inches	*Age in Months* 125½	126½	127½	128½	129½	130½	131½	132½	133½	134½	135½	136½
70 +			1							1		
68–9												
66–7						3						
64–5			1					1				1
62–3					1	1	1	3	2	2	1	3
60–1		3	1		2	6	9	4	5	4	8	9
58–9	1	3	6	7	8	19	20	17	20	27	19	34
56–7	4	27	21	29	31	47	24	44	67	43	58	55
54–5	2	58	59	60	59	74	82	76	94	98	80	72
52–3	1	75	91	77	55	71	88	89	84	80	82	81
50–1	1	48	45	47	41	42	45	38	40	45	35	43
48–9		20	17	23	14	20	15	13	12	8	10	10
46–7		4	6	2	2	3	1	2	3	1	2	3
44–5		1		2	1	1		1	2		1	1
42–3						1	1	1	1			
41 –			2									
Total	9	239	250	247	214	288	286	289	330	309	296	312
Unknown		2	2	2	1	1	1	1	1	2	2	1
Grand Total	9	241	252	249	215	289	287	290	331	311	298	313

Height in inches	*Age in Months—continued* 137½	138½	139½	140½	141½	142½	143½	144½	145½	146½	147½	*Total*
70 +	1											3
68–9								1				1
66–7												3
64–5												3
62–3		1		1	1			3				20
60–1	11	3		2		3			1	1		72
58–9	21	5	5	3	3	2	3	2	1		1	227
56–7	57	12	10	1	1	3	1	3	1			539
54–5	86	23	8	4	4	2	3	4	2	2	1	953
52–3	69	16	8	8	5	3	1	2	1	1		988
50–1	28	5	3	1	2	2	1					512
48–9	7		1	1	1							172
46–7	2											31
44–5	1	1										12
42–3				1								5
41 –												2
Total	283	66	35	22	17	15	9	15	6	4	2	3543
Unknown	2	5	1		3	2				1		30
Grand Total	285	71	36	22	20	17	9	15	6	5	2	3573

TABLE 9—*continued*

HEIGHT BY AGE AT DATE OF MEASUREMENT

v = height in units of two inches with origin at 48·5 inches
y = age in units of one month with origin at 124·5 months
b_{vy} = regression of height on age
r_{vy} = correlation of height and age

BOYS (n = 3,428)

$\Sigma v = 9296$	$\Sigma v^2 = 32248$	$\Sigma' v^2 = 7039{\cdot}24$
$\Sigma y = 28492$	$\Sigma y^2 = 289164$	$\Sigma' y^2 = 52351{\cdot}26$
	$\Sigma vy = 81001$	$\Sigma' vy = 3736{\cdot}81$

$b_{vy} = +0{\cdot}071$ $r_{vy} = +0{\cdot}195$

GIRLS (n = 3,543)

$\Sigma v = 9226$	$\Sigma v^2 = 31966$	$\Sigma' v^2 = 7941{\cdot}42$
$\Sigma y = 29167$	$\Sigma y^2 = 291351$	$\Sigma' y^2 = 51239{\cdot}83$
	$\Sigma vy = 80075$	$\Sigma' vy = 4123{\cdot}90$

$b_{vy} = +0{\cdot}081$ $r_{vy} = +0{\cdot}204$

Boys Measured in June* (n = 2,553)

$\Sigma v = 6789$	$\Sigma v^2 = 23107$	$\Sigma' v^2 = 5053{\cdot}52$
$\Sigma y = 16996$	$\Sigma y^2 = 142356$	$\Sigma' y^2 = 29209{\cdot}11$
	$\Sigma vy = 47349$	$\Sigma' vy = 2152{\cdot}82$

$b_{vy} = +0{\cdot}074$ $r_{vy} = +0{\cdot}177$

* See Table 8A

Girls Measured in June* (n = 2,669)

$\Sigma v = 6768$	$\Sigma v^2 = 22860$	$\Sigma' v^2 = 5697{\cdot}83$
$\Sigma y = 17538$	$\Sigma y^2 = 146950$	$\Sigma' y^2 = 31707{\cdot}80$
	$\Sigma vy = 46872$	$\Sigma' vy = 2399{\cdot}47$

$b_{vy} = +0{\cdot}076$ $r_{vy} = +0{\cdot}178$

* See Table 8B

TABLE 10

Height by Size of Family

(*a*) Boys

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Un-known*	*Grand Total*
70 +		1	1		1												3		3
68–9	1																1		1
66–7			1														1		1
64–5		2	1														3		3
62–3		6	2	1	1	2											12		12
60–1	12	24	8	10	1		1			1			1				58		58
58–9	35	70	65	29	14	8	2	1	1			2	1				228		228
56–7	92	166	133	93	61	32	18	14	5	7	3			1			625	5	630
54–5	115	223	200	151	106	68	45	20	24	3	6		1			1	963	4	967
52–3	84	172	187	181	94	81	45	43	12	10	7	3	2				921	6	927
50–1	32	61	86	83	56	33	32	22	10	9	2		1	1	1		429	5	434
48–9	11	10	26	18	19	12	11	4	4	2	1	1					119	1	120
46–7		6	4	2	4	4	2	1	1	2	1	1					28	1	29
44–5	1	1	1	4		1		1									9		9
42–3		1	3	1													5		5
41 –						1											1		1
Total	383	743	718	573	357	242	156	106	57	34	20	7	6	2	1	1	3406	22	3428
Unknown	2	3	10	3	8	4	2	1	1	1							35		35
Grand Total	385	746	728	576	365	246	158	107	58	35	20	7	6	2	1	1	3441	22	3463

Height by Size of Family

(*b*) Girls

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Un-known*	*Grand Total*
70 +	1	1		1													3		3
68–9									1								1		1
66–7		1	1				1										3		3
64–5		2		1													3		3
62–3	1	12	5	1							1						20		20
60–1	15	26	14	4	6	2	1		1	2							71	1	72
58–9	34	65	54	27	17	9	13	5		1							225	2	227
56–7	91	148	107	90	46	19	17	7	7	2			1	1			536	3	539
54–5	108	225	205	157	92	65	35	28	13	9	6	1		1	1		946	7	953
52–3	98	196	209	143	115	72	51	37	25	20	6	3	3		2		980	8	988
50–1	39	81	86	81	69	51	45	22	14	8	6	3		1			506	6	512
48–9	9	21	30	34	23	18	10	15	4	3	3	1			1		172		172
46–7		5	6	2	5	4	2	2		4							30	1	31
44–5	1	3	2	3	1	1		1									12		12
42–3			4				1										5		5
41 –				1					1								2		2
Total	397	786	723	545	374	241	176	117	66	49	22	8	4	3	4		3515	28	3543
Unknown	4	4	4	3	6	1	3	1	3	1							30		30
Grand Total	401	790	727	548	380	242	179	118	69	50	22	8	4	3	4		3545	28	3573

TABLE 10—*continued*

Height by Size of Family

x = height in units of two inches with origin at 48·5 inches
y = size of family in units
b = regression of height on size of family

Boys

	Size of Family 1	2	3	4	5	6	7	8	9+	*Unknown*
n	383	743	718	573	357	242	156	106	128	22
Σx	1168	2290	1992	1469	896	571	343	226	288	48
Σx^2	4286	8588	7074	4815	2922	1803	993	628	908	146
Mean in inches	54·85	54·91	54·30	53·88	53·77	53·47	53·15	53·01	53·25	53·11

Overall mean for height: 54·17 inches
Overall variance for height: 8·15 (inches)^2

Excluding the cases where size of family is not known:

n = 3406 Σx = 9243 Σy = 12769
Σx^2 = 32017 Σy^2 = 63935 Σxy = 32596

b = 0·256 inches per size of family
or b = 0·09 σ units per size of family

Girls

	Size of Family 1	2	3	4	5	6	7	8	9+	*Unknown*
n	397	786	723	545	374	241	176	117	156	28
Σx	1199	2330	1923	1371	873	517	395	229	319	70
Σx^2	4423	8754	6709	4589	2743	1533	1289	665	1025	236
Mean in inches	54·79	54·68	54·07	53·78	53·42	53·04	53·24	52·66	52·84	53·75

Overall mean for height: 53·96 inches
Overall variance for height: 8·97 (inches)^2

Excluding the cases where size of family is not known:

n = 3515 Σx = 9156 Σy = 13356
Σx^2 = 31730 Σy^2 = 68550 Σxy = 32340

b = 0·275 inches per size of family
or b = 0·09 σ units per size of family

TABLE 11

Height by Father's Occupation

(Date of Measurement Known)

(*a*) Boys

Height in inches	*Father's Occupation* 10	20	30	41	42	51	52	61	62	6x	63	70	80	*Total*	*Unknown*	*Grand Total*
70 +						1		1	1					3		3
68–9								1						1		1
66–7								1						1		1
64–5			1									1		2	1	3
62–3			1	1			2	6	1	1				12		12
60–1	7	5	5	4	2	1	4	16	1	1	4	1	7	58		58
58–9	12	3	16	18	2	8	23	74	23	5	17	5	16	222	6	228
56–7	21	11	39	32	5	20	45	216	69	15	80	19	46	618	12	630
54–5	25	13	50	28	3	21	46	344	134	35	155	21	65	940	27	967
52–3	9	7	35	21	5	10	45	352	140	32	186	15	55	912	15	927
50–1	2		17		1	1	17	154	82	20	98	3	28	423	11	434
48–9		1	7			1	5	31	13	9	42	3	6	118	2	120
46–7							1	10	5	2	10			28	1	29
44–5								4	2		2		1	9		9
42–3						1		1		1			1	4	1	5
41 –													1	1		1
Total	76	40	171	104	18	64	188	1211	471	121	594	68	226	3352	76	3428
Unknown	1	1	2	1			1	12	4	2	6		4	34	1	35
Grand Total	77	41	173	105	18	64	189	1223	475	123	600	68	230	3386	77	3463

(*b*) Girls

Height in inches	*Father's Occupation* 10	20	30	41	42	51	52	61	62	6x	63	70	80	*Total*	*Unknown*	*Grand Total*
70 +							1		1				1	3		3
68–9													1	1		1
66–7								3						3		3
64–5							1	1			1			3		3
62–3	2	1	2	1		1	2	6	2		1		2	20		20
60–1	2		8	3		1	5	25	7	3	6	2	7	69	3	72
58–9	7	6	13	13	4	13	25	64	24	6	19	5	19	218	9	227
56–7	29	6	35	22	3	20	37	191	60	16	51	17	42	529	10	539
54–5	15	14	39	28	7	17	59	354	133	35	145	23	60	929	24	953
52–3	14	9	42	22	4	17	54	335	138	49	205	15	58	962	26	988
50–1	4	2	18	6	3	12	24	186	88	18	113	6	20	500	12	512
48–9	1	1	5	4		1	12	55	33	6	44		6	168	4	172
46–7						1	3	6	8	2	6	2		28	3	31
44–5				1				3	2		5			11	1	12
42–3				1				2			1	1		5		5
41 –							1			1				2		2
Total	74	39	162	101	21	83	224	1231	496	136	597	71	216	3451	92	3543
Unknown	1		1	2			3	6	7		4		3	27	3	30
Grand Total	75	39	163	103	21	83	227	1237	503	136	601	71	219	3478	95	3573

TABLE 11—*continued*

Height by Father's Occupation

x = height in units of two inches with origin at 48·5 inches

Boys

Father's Occupation

	10	20	30	41, 42	51	52	61	62	6x	63	70	80	*Unknown*
n	76	40	171	122	64	188	1211	471	121	594	68	226	76
Σx	281	142	518	437	218	577	3271	1170	282	1350	211	630	204
Σx^2	1151	576	1924	1741	916	2149	11171	3746	924	4104	781	2250	730
Mean in inches	56·14	55·85	54·81	55·91	55·56	54·89	54·15	53·72	53·41	53·30	54·96	54·33	—
Variance in (inches)^2	6·36		8·30	5·76	8·84		7·72	7·49		6·98	7·43	8·74	—

Overall mean for height: 54·17 inches
Overall variance for height: 8·15 (inches)^2

Girls

Father's Occupation

	10	20	30	41, 42	51	52	61	62	6x	63	70	80	*Unknown*
n	74	39	162	122	83	224	1231	496	136	579	71	216	92
Σx	254	123	486	371	254	638	3211	1178	327	1289	205	656	234
Σx^2	1004	459	1808	1423	964	2470	10905	3884	1061	3893	753	2510	832
Mean in inches	55·61	55·06	54·75	54·83	54·87	54·45	53·97	53·50	53·56	53·07	54·52	54·82	—
Variance in (inches)^2	7·26		8·64	9·67	10·97		8·22	8·61		7·44	9·08	9·59	—

Overall mean for height: 53·96 inches
Overall variance for height: 8·97 (inches)^2

TABLE 12

Height by Occupancy Rate

(a) Boys

Height in inches	Occupancy Rate 1	2	3	4	Unknown	Grand Total
70 +		2		1		3
68–9		1				1
66–7		1				1
64–5	1		2			3
62–3	1	5	4	2		12
60–1	19	27	7	5		58
58–9	36	112	61	14	5	228
56–7	81	287	170	87	5	630
54–5	81	427	288	162	9	967
52–3	55	364	297	206	5	927
50–1	10	151	148	122	3	434
48–9	3	38	44	35		120
46–7		6	9	13	1	29
44–5		4	2	3		9
42–3	1	2	1	1		5
41 –			1			1
Unknown	1	14	11	7	2	35
Grand Total	289	1441	1045	658	30	3463

(b) Girls

Height in inches	Occupancy Rate 1	2	3	4	Unknown	Grand Total
70 +		2	1			3
68–9		1				1
66–7		2	1			3
64–5		2	1			3
62–3	5	6	8	1		20
60–1	12	32	19	7	2	72
58–9	40	106	55	25	1	227
56–7	76	256	138	61	8	539
54–5	86	412	309	140	6	953
52–3	53	391	320	216	8	988
50–1	19	178	180	131	4	512
48–9	3	44	64	60	1	172
46–7		8	13	9	1	31
44–5	1	2	4	5		12
42–3	2	2	1			5
41 –			1	1		2
Unknown	2	11	6	7	4	30
Grand Total	299	1455	1121	663	35	3573

TABLE 12—*continued*

HEIGHT BY OCCUPANCY RATE

x = height in units of two inches with origin at 48·5 inches

Boys

	Occupancy Rate 1	2	3	4	*Unknown*	*Grand Total*
n	288	1427	1034	651	28	3428
Σx	993	4086	2657	1471	84	9291
Σx^2	3961	14522	8791	4579	310	32163
Mean in inches	55·65	54·48	53·89	53·27	54·75	54·17
Variance in (inches)^2	7·49	7·92	7·60	7·72	8·59	8·15

Overall mean for height: 54·17 inches
Overall variance for height: 8·15 (inches)^2

Girls

	Occupancy Rate 1	2	3	4	*Unknown*	*Grand Total*
n	297	1444	1115	656	31	3543
Σx	986	4032	2744	1378	86	9226
Σx^2	3920	14308	9220	4202	316	31966
Mean in inches	55·39	54·33	53·67	52·95	54·30	53·96
Variance in (inches)^2	8·74	8·45	8·86	7·98	10·32	8·97

Overall mean for height: 53·96 inches
Overall variance for height: 8·97 (inches)^2

TABLE 13

Height by Date of Mother's Birth

(a) Boys

Height in inches	*Date of Mother's Birth* –1889	1890–4	1895–9	1900–4	1905–9	1910-14	1915-19	1920 +	*Total*	*Un-known*	*Grand Total*
70 +			1		1	1			3		3
68–9						1			1		1
66–7						1			1		1
64–5				1		2			3		3
62–3			1	3	4	3			11	1	12
60–1		1	10	12	17	12	1		53	5	58
58–9		4	27	54	67	53	12		217	11	228
56–7	3	16	53	143	177	167	44	2	605	25	630
54–5	3	16	83	202	253	281	91	1	930	37	967
52–3	3	22	91	171	257	259	90	3	896	31	927
50–1	2	8	43	67	100	134	67	4	425	9	434
48–9			8	19	29	37	20	2	115	6	121
46–7			2	3	10	7	4	1	27	2	29
44–5			1	2		3	3		9		9
42–3					1	2	1		4	1	5
41 –					1				1		1
Total	11	67	320	677	917	963	333	13	3301	128	3429
Unknown			2	7	16	6			31	3	34
Grand Total	11	67	322	684	933	969	333	13	3332	131	3463

(b) Girls

Height in inches	*Date of Mother's Birth* –1889	1890–4	1895–9	1900–4	1905–9	1910-14	1915-19	1920 +	*Total*	*Un-known*	*Grand Total*
70 +				2	1	1			4		4
68–9					1				1		1
66–7			1	1			1		3		3
64–5				1	2				3		3
62–3			2	6	3	5	1		17	3	20
60–1		1	11	10	21	18	7		68	4	72
58–9		5	29	48	62	58	11		213	14	227
56–7	1	14	49	119	151	139	45	1	519	20	539
54–5	1	24	74	210	250	279	76	3	917	36	953
52–3	2	20	79	214	244	277	111	4	951	37	988
50–1		10	50	99	126	166	43		494	18	512
48–9	1	2	10	33	38	56	28		168	4	172
46–7	1		3	7	7	7	3		28	3	31
44–5			1	1	3	6			11	1	12
42–3	1		2	1	1				5		5
41 –					1	1			2		2
Total	7	76	311	752	911	1013	326	8	3404	140	3544
Unknown		1	4	6	1	11	2		25	4	29
Grand Total	7	77	315	758	912	1024	328	8	3429	144	3573

TABLE 13—*continued*

Height by Date of Mother's Birth

x = height in units of two inches with origin at 48·5 inches

Boys

	Date of Mother's Birth				
	–1899	1900–4	1905–9	1910–14	1915 +
n	398	677	917	963	346
Σx	1114	1951	2540	2537	767
Σx^2	3934	6861	8876	8730	2445
Mean in inches	54·35	54·51	54·29	54·02	53·18
Variance in (inches)^2	8·20	7·32	8·03	8·50	8·61

Overall mean for height: 54·17 inches
Overall variance for height: 8·15 (inches)^2

Girls

	Date of Mother's Birth				
	–1899	1900–4	1905–9	1910–14	1915 +
n	394	752	911	1013	334
Σx	1065	2002	2442	2545	806
Σx^2	3875	7010	8614	8532	2584
Mean in inches	54·16	54·07	54·11	53·77	53·58
Variance in (inches)^2	10·11	8·94	9·08	8·44	7·65

Overall mean for height: 53·96 inches
Overall variance for height: 8·97 (inches)^2

TABLE 14

Height by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 10

Height in inches	Size of Family: 1	2	3	4	5	6	7	8	9	10	11	12+	Total	Un-known	Grand Total
70+															
68–9															
66–7															
64–5															
62–3		2											2		2
60–1	1	6	2										9		9
58–9	7	8	2	2									19		19
56–7	9	20	11	7	2	1							50		50
54–5	5	15	12	3	1	2	1						39	1	40
52–3	5	5	12	1									23		23
50–1	2	2	1	1									6		6
48–9	1												1		1
46–7															
44–5															
42–3															
41–															
Total	30	58	40	14	3	3	1						149	1	150
Unknown	1		1										2		2
Grand Total	31	58	41	14	3	3	1						151	1	152

Father's Occupation Group 20

Height in inches	Size of Family: 1	2	3	4	5	6	7	8	9	10	11	12+	Total	Un-known	Grand Total
70+															
68–9															
66–7															
64–5															
62–3			1										1		1
60–1	1	2	1	1									5		5
58–9	2	2	3				1	1					9		9
56–7	1	6	4	3	2	1							17		17
54–5	8	13	4	1		1							27		27
52–3	1	6	3	1	1	2			1				15	1	16
50–1		1	1										2		2
48–9		1	1										2		2
46–7															
44–5															
42–3															
41–															
Total	13	31	18	6	3	4	1	1	1				78	1	79
Unknown						1							1		1
Grand Total	13	31	18	6	3	5	1	1	1				79	1	80

TABLE 14—*continued*

Height by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 30

Height in inches	1	2	3	4	5	6	7	8	9	10	11	12 +	Total	Un-known	Grand Total
							Size of Family								
70 +															
68–9															
66–7															
64–5			1										1		1
62–3	1	1		1									3		3
60–1	3	8		1	1								13		13
58–9	7	9	9	2	1		1						29		29
56–7	16	29	11	9	5	1	3						74		74
54–5	13	20	28	14	4	6	1	2					88	1	89
52–3	13	19	12	12	6	2	3	3	1	1	2		74	3	77
50–1	5	6	9	8	1	3	3						35		35
48–9	2	2	2	1		2	2			1			12		12
46–7															
44–5															
42–3															
41 –															
Total	60	94	72	48	18	14	13	5	1	2	2		329	4	333
Unknown		1	1		1								3		3
Grand Total	60	95	73	48	19	14	13	5	1	2	2		332	4	336

Father's Occupation Groups 41 and 42

Height in inches	1	2	3	4	5	6	7	8	9	10	11	12 +	Total	Un-known	Grand Total
							Size of Family								
70 +															
68–9															
66–7															
64–5															
62–3		1	1										2		2
60–1	3	4	1		1								9		9
58–9	8	16	10	1	1		1						37		37
56–7	13	27	13	4	1		3	1					62		62
54–5	13	30	10	8	3	2							66		66
52–3	15	17	9	6	2		3						52		52
50–1	4	3	2					1					10		10
48–9	1	1		1							1		4		4
46–7															
44–5		1											1		1
42–3			1										1		1
41 –															
Total	57	100	47	20	8	2	7	2			1		244		244
Unknown	1		1		1								3		3
Grand Total	58	100	48	20	9	2	7	2			1		247		247

TABLE 14—*continued*

Height by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 51

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
70 +		1											1		1
68-9															
66-7															
64-5															
62-3											1		1		1
60-1			2										2		2
58-9	8	6	7										21		21
56-7	11	14	8	3	4								40		40
54-5	5	16	10	3	1	2							37	1	38
52-3	3	5	10	4	4				1				27		27
50-1	4	1	6		1		1						13		13
48-9	1		1										2		2
46-7				1									1		1
44-5															
42-3		1											1		1
41 –															
Total	32	44	44	11	10	2	1		1		1		146		147
Unknown															
Grand Total	32	44	44	11	10	2	1		1		1		146	1	147

Father's Occupation Group 52

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
70 +	1												1		1
68-9															
66-7															
64-5		1											1		1
62-3		3	1										4		4
60-1	1	5	2	1									9		9
58-9	6	14	15	6	4	1	2						48		48
56-7	16	28	19	10	5		1		2			1	82		82
54-5	11	37	27	13	12	1	1	1	2				105		105
52-3	7	31	30	10	13	2	3	1			1		98	1	99
50-1	5	11	8	9	3	1	3						40	1	41
48-9		1	6	3	2	1	1	1	2				17		17
46-7			1			2		1					4		4
44-5															
42-3															
41 –									1				1		1
Total	47	131	109	52	39	8	11	4	7		1	1	410	2	412
Unknown	2		1						1				4		4
Grand Total	49	131	110	52	39	8	11	4	8		1	1	414	2	416

TABLE 14—*continued*

Height by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 61

Height in inches	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12+	Total	Unknown	Grand Total
70+			1										1		1
68–9	1												1		1
66–7		1	2				1						4		4
64–5		1											1		1
62–3		7	3		1	1							12		12
60–1	6	19	5	5	1	1	1		1	1			40	1	41
58–9	17	44	36	19	10	6	4	1					137	1	138
56–7	67	112	81	64	38	21	12	3	4	2	1		405	2	407
54–5	86	177	157	111	73	44	18	8	15	3	2	1	695	3	698
52–3	71	150	143	113	70	59	26	29	11	6	2	4	684	3	687
50–1	22	60	63	68	48	28	18	8	5	8	4	5	337	3	340
48–9	4	13	20	12	13	7	4	6	1	2	3	1	86		86
46–7		5	3	1	2		2		1		1	1	16		16
44–5	1	3		2				1					7		7
42–3			3										3		3
41–															
Total	275	592	517	395	256	167	86	56	38	22	13	12	2429	13	2442
Unknown	2	4	3	1	5	1	1		1				18		18
Grand Total	277	596	520	396	261	168	87	56	39	22	13	12	2447	13	2460

Father's Occupational Group 62

Height in inches	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12+	Total	Unknown	Grand Total
70+				1	1								2		2
68–9															
66–7															
64–5															
62–3		2				1							3		3
60–1	2	2		1	1	1	1						8		8
58–9	3	15	11	10	4	2			1			1	47		47
56–7	17	25	26	26	17	5	4	7	1	1			129		129
54–5	23	43	56	42	37	20	16	15	5	5	4	1	267		267
52–3	15	54	53	48	40	26	14	12	6	7	3	1	279		279
50–1	7	20	26	32	28	16	20	10	5	2	1	1	168	2	170
48–9	1	4	10	9	10	2	2	4	1	2		1	46		46
46–7		1	3		1	2	2			3			12	1	13
44–5			1	3									4		4
42–3															
41–															
Total	68	166	186	172	139	75	59	48	19	20	8	5	965	3	968
Unknown			2		3	1	2	2		1			11		11
Grand Total	68	166	188	172	142	76	61	50	19	21	8	5	976	3	979

TABLE 14—*continued*

Height by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 6x

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
70+															
68–9															
66–7															
64–5															
62–3		1											1		1
60–1	1	1		1	1								4		4
58–9		3	3	4		1							11		11
56–7	4	8	9	6	1	1		1	1				31	1	32
54–5	9	11	16	11	8	9	3	2			1		70	1	71
52–3	6	10	20	14	7	9	3	3	1	4		2	79	2	81
50–1	3	5	7	4	4	7	6	1		1			38		38
48–9			3	3	2	3	3						14	1	15
46–7						1				1			2	1	3
44–5															
42–3			1										1		1
41–				1									1		1
Total	23	39	59	44	23	31	15	7	2	6	1	2	252	6	258
Unknown			1				1						2		2
Grand Total	23	39	60	44	23	31	16	7	2	6	1	2	254	6	260

Father's Occupation Group 63

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
70+															
68–9															
66–7															
64–5				1									1		1
62–3				1									1		1
60–1	3	2	2	2						1			10		10
58–9	4	2	12	5	3		4	3		1		2	36		36
56–7	13	19	28	31	13	11	6	4	1	2	1	2	131		131
54–5	23	49	41	66	38	29	27	14	4	1	3	2	297	3	300
52–3	26	41	72	83	44	40	32	24	10	9	3	3	387	3	390
50–1	6	22	31	29	30	25	24	22	11	6	2		208	3	211
48–9	3	6	10	21	11	15	7	8	4			1	86		86
46–7		4	1	1	4	3		2		1			16		16
44–5	1		2	1	1	2							7		7
42–3							1						1		1
41–															
Total	79	145	199	241	144	125	101	77	30	21	9	10	1181	9	1190
Unknown			2	2	3	1			2				10		10
Grand Total	79	145	201	243	147	126	101	77	32	21	9	10	1191	9	1200

TABLE 14—*continued*

Height by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 70

Height in inches	1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
70 +															
68–9															
66–7															
64–5															
62–3															
60–1	1		2										3		3
58–9	1	3	3	1	1	1							10		10
56–7	2	8	6	4	7	2	2	2	1	1			35	1	36
54–5	3	12	11	7	4	1	2	2		1	1		44		44
52–3	3	5	4	8	4	1	1	2				2	30		30
50–1		2	1	1	1	2	1				1		9		9
48–9	1		1				1						3		3
46–7				1						1			2		2
44–5															
42–3			1	1									2		2
41 –															
Total	11	30	29	23	17	7	7	6	1	3	2	2	138	1	139
Unknown															
Grand Total	11	30	29	23	17	7	7	6	1	3	2	2	138	1	139

Father's Occupation Group 80

Height in inches	1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
70 +		1		1									2		2
68–9									1				1		1
66–7															
64–5		1											1		1
62–3		1	1										2		2
60–1	3	1	4	1	2					1		1	13		13
58–9	4	6	7	6	7	2	2	1					35		35
56–7	6	16	19	15	12	6	4	3	2	2	1		86	2	88
54–5	11	16	23	20	12	14	9	4	11	1	1	1	123	1	124
52–3	12	19	17	17	15	9	8	5	6	2	2	1	113		113
50–1	6	4	11	10	8	2	1	1	2			1	46	2	48
48–9	3	3	2	2	1		1						12		12
46–7															
44–5				1									1		1
42–3															
41 –						1							1		1
Total	45	68	84	73	57	34	25	14	22	6	4	4	436	5	441
Unknown		1	2	2	1		1						7		7
Grand Total	45	69	86	75	58	34	26	14	22	6	4	4	443	5	448

TABLE 14—*continued*

Height by Size of Family for Father's Occupation

x = height in units of two inches with origin at 48·5 inches

Father's Occupation		Size of Family 1	2	3	4	5	6	7	8	9	10	11	12+	Total	Unknown
10	n	30	58	40	14	7*								149	1
	$\sum x$	104	227	127	50	24								532	3
	$\sum x^2$	422	991	455	194	84								2146	9
	Mean in inches	55·68	56·58	55·10	55·89	55·61									
	Overall mean for height: 55·89 inches														
20	n	13	31	18	16*									78	1
	$\sum x$	46	98	63	56									263	2
	$\sum x^2$	178	360	273	220									1031	4
	Mean in inches	55·83	55·07	55·75	55·00										
	Overall mean for height: 55·49 inches														
30	n	60	94	72	48	18	14	13	10*					329	4
	$\sum x$	194	320	214	133	56	29	29	20					995	9
	$\sum x^2$	762	1288	774	461	202	81	97	46					3711	21
	Mean in inches	55·22	55·56	54·69	54·29	54·97	52·89	53·21	52·75						
	Overall mean for height: 54·80 inches														
41, 42	n	57	100	47	20	20*								244	
	$\sum x$	183	344	162	57	62								808	
	$\sum x^2$	697	1370	680	185	232								3164	
	Mean in inches	55·17	55·63	55·64	54·45	54·95									
	Overall mean for height: 55·37 inches														
51	n	32	44	44	11	10	5*							146	1
	$\sum x$	109	153	135	28	28	16							469	3
	$\sum x^2$	437	669	511	92	90	72							1871	9
	Mean in inches	55·56	55·71	54·89	53·84	54·35	55·15								
	Overall mean for height: 55·18 inches														
52	n	47	131	109	52	39	8	11	13*					410	2
	$\sum x$	163	425	318	144	105	11	26	20					1212	3
	$\sum x^2$	695	1657	1172	512	343	45	90	100					4614	5
	Mean in inches	50·97	55·24	54·58	54·29	54·14	55·63	53·48	56·44						
	Overall mean for height: 54·66 inches														

* Includes larger sizes of family

TABLE 14—*continued*

Height by Size of Family for Father's Occupation

Father's Occupation		Size of Family 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*
61	n	275	592	517	395	256	167	86	56	38	22	13	12	2429	13
	Σx	819	1728	1392	1003	620	405	205	105	93	43	17	15	6445	37
	Σx^2	2897	6334	4884	3207	1930	1231	695	273	285	127	47	31	21941	135
	Mean in inches	54·71	54·59	54·14	53·83	53·59	53·60	53·52	52·50	53·65	52·66	51·37	51·25		
	Overall mean for height: 54·06 inches														
62	n	68	166	186	172	139	75	59	48	19	20	13*		965	3
	Σx	201	457	454	419	323	169	116	107	41	32	30		2349	1
	Σx^2	693	1569	1440	1437	1051	517	322	305	115	94	88		7631	3
	Mean in inches	54·66	54·26	53·63	53·35	53·40	53·26	52·68	53·21	53·07	51·95	53·37			
	Overall mean for height: 53·62 inches														
6x	n	23	39	59	44	23	31	15	18*					252	18
	Σx	64	118	143	111	52	60	21	38					607	10
	Σx^2	208	432	459	407	156	166	45	102					1975	34
	Mean in inches	54·32	54·80	53·60	53·80	53·27	52·62	51·55	52·97						
	Overall mean for height: 53·57 inches														
63	n	79	145	199	241	144	125	101	77	30	21	19*		1181	9
	Σx	215	345	477	566	293	229	210	141	47	45	51		2619	18
	Σx^2	737	1057	1517	1766	839	633	600	385	103	145	169		7951	42
	Mean in inches	54·19	53·51	53·54	53·45	52·82	52·41	52·91	52·41	51·88	53·04	54·12			
	Overall mean for height: 53·19 inches														
70	n	11	30	29	23	17	28*							138	1
	Σx	34	95	90	55	54	73							401	4
	Σx^2	132	333	368	195	190	245							1463	16
	Mean in inches	54·93	55·08	54·96	53·53	55·10	53·96								
	Overall mean for height: 54·56 inches														
80	n	45	68	84	73	57	34	25	14	22	14*			436	5
	Σx	125	216	256	209	169	92	70	40	65	44			1286	9
	Σx^2	457	900	958	809	615	326	228	130	257	168			4848	43
	Mean in inches	54·31	55·10	54·85	54·48	54·68	54·16	54·35	54·46	54·66	55·04				
	Overall mean for height: 54·65 inches														

* Includes larger sizes of family

Height by Size of Family for Occupational Classes 1, 4 and 6

(Mean Heights in Inches)

Occupational Class	Size of Family 1	2	3	4	5	6	7	8	9	10	11	*Total*
1	55·73	56·05	55·30	56·05	55·46*							55·74
4	55·64	55·36	54·67	54·21	53·18	52·15	53·25	52·62*				54·75
6	54·57	54·54	53·62	53·66	52·15	53·07	52·45	53·26	53·23	51·83	53·38*	53·54

* Includes larger sizes of family

TABLE 15

Height by Size of Family for Occupancy Rate

Boys and Girls

Occupancy Rate 1

Height in inches	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12 +	Total	Unknown	Grand Total
70 +															
68–9															
66–7															
64–5		1											1		1
62–3	1	2	2			1							6		6
60–1	11	10	8	2									31		31
58–9	30	29	17										76		76
56–7	48	69	18	11	9	2							157		157
54–5	51	60	30	11	5	7	1						165	2	167
52–3	31	28	26	14	3	2	1		2				107	1	108
50–1	11	11	3		3		1						29		29
48–9	2	3	1										6		6
46–7															
44–5		1											1		1
42–3			2	1									3		3
41 –															
Total	185	214	107	39	20	12	3		2				582	3	585
Unknown	1		2										3		3
Grand Total	186	214	109	39	20	12	3		2				585	3	588

Occupancy Rate 2

Height in inches	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12 +	Total	Unknown	Grand Total
70 +	1	2			1								4		4
68–9	1								1				2		2
66–7			2				1						3		3
64–5		2											2		2
62–3		8	2		1								11		11
60–1	12	29	9	4	3							1	58	1	59
58–9	34	62	69	23	12	7	7	1		1			216	2	218
56–7	110	148	134	71	41	13	9	6	5	2		2	541	3	544
54–5	147	201	221	116	82	28	19	13	10				837	2	839
52–3	123	189	186	116	60	25	27	15	5	2	3	1	752	3	755
50–1	46	64	76	51	34	21	15	6	4	6	1		324	5	329
48–9	8	15	27	12	11	5	2			1	1		82		82
46–7		4	4	2	2					1			13		13
44–5	1			3		1		1					6		6
42–3		1	2				1						4		4
41 –															
Total	483	725	732	398	247	100	81	42	25	13	5	4	2855	16	2871
Unknown	5	1	8	3	2	2	1	2	1				25		25
Grand Total	488	726	740	401	249	102	82	44	26	13	5	4	2880	16	2896

TABLE 15—*continued*

Height by Size of Family for Occupancy Rate

Boys and Girls

Occupancy Rate 3

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Un-known*	*Grand Total*
70+				1									1		1
68–9															
66–7		1											1		1
64–5		1	1	1									3		3
62–3		7	3	1							1		12		12
60–1	2	10	3	4	3	2			1	1			26		26
58–9	3	36	29	17	11	7	6	3	1			3	116		116
56–7	12	82	64	55	37	22	16	7	5	4	1	1	306	2	308
54–5	13	152	125	94	60	66	30	16	17	10	7	1	591	6	597
52–3	13	110	144	83	81	80	26	35	15	16	4	6	613	4	617
50–1	8	48	66	50	43	37	34	19	11	4	3	2	325	3	328
48–9	4	9	20	21	15	15	7	8	4	2	1	2	108	1	109
46–7		3	5	1	2	5	1	1		2			20	2	22
44–5		2	1	2		1							6		6
42–3			2										2		2
41–						1			1				2		2
Total	55	461	463	330	252	236	120	89	55	39	17	15	2132	18	2150
Unknown		2	2	1	6	1	1		2	1			16		16
Grand Total	55	463	465	331	258	237	121	89	57	40	17	15	2148	18	2166

Occupancy Rate 4

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Un-known*	*Grand Total*
70+			1	1									2		2
68–9															
66–7															
64–5															
62–3		1		1		1							3		3
60–1		1	2	3	1		2			2			11		11
58–9	1	5	4	16	7	2	2	2					39		39
56–7	11	14	20	46	19	13	9	8	2	3	2		147	1	148
54–5	12	33	24	84	51	30	29	19	10	1	5	4	302		302
52–3	13	38	38	108	65	44	42	30	15	12	6	6	417	5	422
50–1	6	19	23	61	45	25	27	19	9	7	4	5	250	3	253
48–9	5	5	8	19	16	10	12	11	4	2	2	1	95		95
46–7		3	1	1	4	2	3	2	1	3	1	1	22		22
44–5	1	1	2	2	1			1					8		8
42–3			1										1		1
41–				1									1		1
Total	49	120	124	343	209	127	126	92	41	30	20	17	1298	9	1307
Unknown		1	1	2	4	2	3		1				14		14
Grand Total	49	121	125	345	213	129	129	92	42	30	20	17	1312	9	1321

TABLE 15—*continued*

Height by Size of Family for Occupancy Rate

x = height in units of two inches with origin at 48·5 inches

Occupancy Rate		*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12
1	n	185	214	107	39	20	12	5*					
	Σx	641	748	358	114	60	40	10					
	Σx^2	2557	3018	1494	412	204	152	22					
	Mean in inches	55·68	55·74	55·44	54·60	54·75	55·42	52·75					

Overall mean for height: 55·52 inches
Overall variance for height: 8·296 (inches)^2

Occupancy Rate		1	2	3	4	5	6	7	8	9	10	11	12
2	n	483	725	732	398	247	100	81	42	25	13	9*	
	Σx	1434	2208	2068	1046	658	240	203	102	74	22	23	
	Σx^2	5128	8366	7284	3428	2248	760	703	308	294	72	85	
	Mean in inches	54·69	54·84	54·40	54·01	54·08	53·55	53·76	53·61	54·67	52·14	53·86	

Overall mean for height: 54·41 inches
Overall variance for height: 8·157 (inches)^2

Occupancy Rate		1	2	3	4	5	6	7	8	9	10	11	12
3	n	55	461	463	330	252	236	120	89	55	39	17	5*
	Σx	148	1351	1164	848	604	519	269	179	119	86	43	36
	Σx^2	516	4927	3862	2920	1884	1575	815	491	381	260	147	126
	Mean in inches	54·13	54·61	53·78	53·89	53·54	53·15	53·23	52·77	53·08	53·16	53·81	53·55

Overall mean for height: 53·78 inches
Overall variance for height: 8·257 (inches)^2

Occupancy Rate		1	2	3	4	5	6	7	8	9	10	11	12
4	n	49	120	124	343	209	127	126	92	41	30	20	17*
	Σx	115	283	286	820	439	270	253	174	76	55	38	28
	Σx^2	371	909	1022	2688	1287	780	725	494	192	187	106	66
	Mean in inches	53·44	53·47	53·36	53·53	52·95	53·00	52·77	52·53	52·46	52·42	52·55	52·04

Overall mean for height: 53·12 inches
Overall variance for height: 8·102 (inches)^2

* Includes larger sizes of family

TABLE 16

Height by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1889 and Earlier

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Un-known*	*Grand Total*
70+															
68–9															
66–7															
64–5															
62–3															
60–1															
58–9															
56–7	1	1		1	1								4		4
54–5				1		1	1		1				4		4
52–3			1	2			1						4	1	5
50–1					1		1						2		2
48–9					1								1		1
46–7										1			1		1
44–5															
42–3			1										1		1
41 –															
Total	1	1	2	4	3	1	3		1	1			17	1	18
Unknown															
Grand Total	1	1	2	4	3	1	3		1	1			17	1	18

Date of Mother's Birth 1890–4

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Un-known*	*Grand Total*
70+															
68–9															
66–7															
64–5															
62–3															
60–1			2										2		2
58–9		1		2	1	1	2		1			1	9		9
56–7	2	4	2	3	5	2	4	1	6	1			30		30
54–5	3	2	6	9	5	4	4	1	1		4		39	1	40
52–3	2	2	7	5	8	3	4	2	6	2		1	42		42
50–1	1	1	3	3	3	1	3	2			1		18		18
48–9							1	1					2		2
46–7															
44–5															
42–3															
41 –															
Total	8	10	20	22	22	11	18	7	14	3	5	2	142	1	143
Unknown									1				1		1
Grand Total	8	10	20	22	22	11	18	7	15	3	5	2	143	1	144

TABLE 16—*continued*

Height by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1895-9

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
70 +					1								1		1
68–9															
66–7							1						1		1
64–5															
62–3		1		1		1							3		3
60–1	2	9	2	2	3		1			2			21		21
58–9	11	9	9	6	9	5	3	3		1			56		56
56–7	13	21	18	16	19	4	3	2	2		3	1	102		102
54–5	12	20	20	25	32	18	9	7	10	2	2		157		157
52–3	11	18	28	25	20	14	9	19	6	10	2	8	170		170
50–1	4	8	8	9	12	12	17	9	4	6		1	90	3	93
48–9		2	2	3	1	1	3	5			1		18		18
46–7		1	1			1	1				1		5		5
44–5		1	1										2		2
42–3			1				1						2		2
41 –															
Total	53	90	90	87	97	56	48	45	22	21	9	10	628	3	631
Unknown		1	1		1	1		1	1				6		6
Grand Total	53	91	91	87	98	57	48	46	23	21	9	10	634	3	637

Date of Mother's Birth 1900–4

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
70 +	1	1											2		2
68–9															
66–7		1											1		1
64–5		1		1									2		2
62–3		5	2		1						1		9		9
60–1	3	8	4	4	1	1			1				22		22
58–9	13	33	32	9	6	2	5	2					102		102
56–7	38	62	52	43	23	18	13	6	2	5			262		262
54–5	42	92	72	67	40	29	26	14	11	4	2	8	407	5	412
52–3	30	58	76	74	37	40	22	22	11	7	8		385		385
50–1	18	18	16	21	20	18	21	14	11	6	3		166		166
48–9	1	5	7	11	6	8	4	2	2	3	1	2	52		52
46–7		1	2		2		2			2			9	1	10
44–5	1			2									3		3
42–3			1										1		1
41 –															
Total	147	285	264	232	136	116	93	60	38	27	15	10	1423	6	1429
Unknown	1	1	5		4		1		1				13		13
Grand Total	148	286	269	232	140	116	94	60	39	27	15	10	1436	6	1442

TABLE 16—*continued*

Height by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1905–9

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
70+		1		1									2		2
68–9									1				1		1
66–7															
64–5		2											2		2
62–3		5	1			1							7		7
60–1	10	15	5	6		1				1			38		38
58–9	22	41	35	17	7	3	1	1				1	128	1	129
56–7	57	98	75	52	21	11	4	8		2			328		328
54–5	55	139	116	65	50	32	16	14	7	2	2	1	499	4	503
52–3	36	113	100	86	51	47	25	19	9	5	3	4	498	3	501
50–1	12	31	33	43	42	26	14	12	4	2	2	4	225	1	226
48–9	3	7	13	8	8	8	7	5	4	2	1	1	67		67
46–7		2	2	2	3	2	1	2		2		1	17		17
44–5	1			1	1								3		3
42–3		1	1										2		2
41 –				1		1							2		2
Total	196	455	381	282	183	132	68	61	25	16	8	12	1819	9	1828
Unknown	1		2	3	5	1	3	1		1			17		17
Grand Total	197	455	383	285	188	133	71	62	25	17	8	12	1836	9	1845

Date of Mother's Birth 1910–14

Height in inches	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
70+			1	1									2		2
68–9	1												1		1
66–7			1										1		1
64–5		1	1										2		2
62–3	1	6	1										8		8
60–1	8	11	8		1		1						29	1	30
58–9	17	38	26	17	7	4	2						111		111
56–7	51	93	66	45	29	9	7	3	1				304	2	306
54–5	71	144	131	102	45	36	18	6	4	1	1		559	1	560
52–3	54	122	137	84	63	28	27	8	5	4			532	4	536
50–1	23	52	72	65	33	21	19	7	2	1	2		297	3	300
48–9	7	10	24	18	18	6	3	4	1		1		92	1	93
46–7		4	2	1	2	2		1		1			13	1	14
44–5		2	2	2		2		1					9		9
42–3			1	1									2		2
41 –									1				1		1
Total	233	483	473	336	198	108	77	30	14	7	4		1963	13	1976
Unknown	2	3	4	2	2	2	1		1				17		17
Grand Total	235	486	477	338	200	110	78	30	15	7	4		1980	13	1993

TABLE 16—*continued*

Height by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1915–19

Height in inches	1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
70 +															
68-9															
66–7			1										1		1
64–5															
62–3		1											1		1
60–1	2	4	1		1								8		8
58-9	1	7	9	4	1		1						23		23
56–7	13	25	23	15	5	5	3						89		89
54–5	23	42	40	25	20	7	4	2	1	1	1		166	1	167
52–3	36	49	36	36	23	10	4	4					198	3	201
50–1	9	28	29	19	14	5	2		2				108	2	110
48–9	6	7	9	10	6	6	2	1	1				48		48
46–7		2	3	1		1							7		7
44–5		1		2									3		3
42–3			1										1		1
41 –															
Total	90	166	152	112	70	34	16	7	4	1	1		653	6	659
Unknown	1			1									2		2
Grand Total	91	166	152	113	70	34	16	7	4	1	1		655	6	661

Date of Mother's Birth 1920 and Later

Height in inches	1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
70 +															
68–9															
66–7															
64–5															
62–3															
60–1															
58–9															
56–7	1	1											2	1	3
54–5	1	1		1						1			4		4
52–3	2		2	1	1	1							7		7
50–1	2	1	1										4		4
48–9		1			1								2		2
46–7						1							1		1
44–5															
42–3															
41 –															
Total	6	4	3	2	2	2				1			20	1	21
Unknown															
Grand Total	6	4	3	2	2	2				1			20	1	21

TABLE 16—*continued*

HEIGHT BY SIZE OF FAMILY FOR DATE OF MOTHER'S BIRTH

x = height in units of two inches with origin at 48·5 inches
(Overall Mean includes Size of Family Unknown)

Date of Mother's Birth		*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*
–1889	n	1	1	2	4	3	1	3		1	1			17	1
	$\sum x$	4	4	–1	11	5	3	6		3	–1			34	2
	$\sum x^2$	16	16	13	33	17	9	14		9	1			128	4
	Overall mean for height: 52·75 inches														
1890–4	n	8	10	20	22	22	11	18	7	14	3	5	2	142	1
	$\sum x$	22	32	55	62	59	32	49	13	44	8	13	7	396	3
	$\sum x^2$	68	116	189	202	185	106	169	35	154	24	37	29	1314	9
	Overall mean for height: 54·33 inches														
1895–9	n	53	90	90	87	97	56	48	45	22	21	19		628	3
	$\sum x$	181	291	247	247	298	141	100	91	54	49	42		1741	3
	$\sum x^2$	711	1199	899	861	1138	469	384	255	150	161	124		6351	3
	Overall mean for height: 54·28 inches														
1900–4	n	147	285	264	232	136	116	93	60	38	27	15	10	1423	6
	$\sum x$	448	933	785	615	347	273	218	134	80	50	32	24	3939	14
	$\sum x^2$	1682	3695	2853	2049	1133	813	678	374	222	152	102	72	13825	44
	Mean in inches	54·60	55·05	54·45	53·80	53·60	53·21	53·19	53·22	52·96	52·45	53·02	53·55		
	Overall mean for height: 54·28 inches														
1905–9	n	196	455	381	282	183	132	68	61	25	16	8	12	1819	9
	$\sum x$	645	1412	1088	742	408	282	132	127	53	30	14	19	4958	24
	$\sum x^2$	2477	5372	3792	2588	1214	856	348	369	203	110	32	55	17416	74
	Mean in inches	55·33	54·98	54·46	54·01	53·21	53·02	52·63	52·91	52·99	52·50	52·25	51·92		
	Overall mean for height: 54·20 inches														
1910–14	n	233	483	473	336	198	108	77	30	14	7	4		1963	13
	$\sum x$	698	1398	1207	807	449	235	171	50	24	11	5		5055	27
	$\sum x^2$	2556	5040	4127	2603	1367	711	487	146	90	27	11		17165	97
	Mean in inches	54·74	54·54	53·85	53·55	53·29	53·10	53·19	52·08	52·18	51·89	51·25			
	Overall mean for height: 53·89 inches														
1915–19	n	90	166	152	112	70	34	16	13					653	6
	$\sum x$	219	414	367	241	151	65	39	25					1521	11
	$\sum x^2$	665	1376	1255	737	427	189	127	63					4839	23
	Mean in inches	53·62	53·74	53·58	53·05	53·06	52·57	53·63	52·60						
	Overall mean for height: 53·40 inches														
1920+	n	6	4	3	2	2	2	1						20	1
	$\sum x$	13	8	5	5	2	1	3						37	4
	$\sum x^2$	35	26	9	13	4	5	9						101	16
	Overall mean for height: 52·65 inches														
All dates before 1899	Mean in inches	55·43	55·23	54·13	54·41	54·68	53·93	53·24	52·75	54·21	53·23	53·52			
	Overall mean for height: 54·25 inches														
All dates after 1915	Mean in inches	53·58	53·71	53·55	53·07	53·00	52·42	53·62	52·75	51·25	60·75	51·75			
	Overall mean for height: 53·38 inches														

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DISTRIBUTION OF WEIGHT

TABLE 17

Weight by Month of Birth for Month of Measurement

(*a*) Boys

Measured in May 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
						Month of Birth							
120 +	1												1
115–9													
110–4						1							1
105–9													
100–4		1											1
95–9			1				1						2
90–4	1	1	1	1		1		1	1	1			8
85–9	1	2		1	2	2		1					9
80–4	1	2	3	1		1	2	2	2				14
75–9	2	2	5	2	4	3	3	4	5	3	3		36
70–4	1	6		2	2	3	2	2		4		5	27
65–9	3	2	2	5	3	3	4	3	1	3	4	3	36
60–4	2	4	1	3	1	5	1	4	2	4	1	4	32
55–9			1		1	1	1		1		2	1	8
50–4						1	1	2	1		2	1	8
49 –													
Total	12	20	14	15	13	21	15	19	13	15	12	14	183
Unknown													
Grand Total	12	20	14	15	13	21	15	19	13	15	12	14	183

Measured in June 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
						Month of Birth							
120 +					1					1			2
115–9					1								1
110–4	1		1	1			1	1					5
105–9		1					1	1	1				4
100–4	1		2		1			2					6
95–9	1	3	3	4	3	1		1	2			1	19
90–4	3	3	4	2	3	3	5	4	2	2	1	1	33
85–9	10	7	10	7	15	3	9	4	6	2	3	2	78
80–4	15	21	24	18	17	18	19	12	18	10	11	5	188
75–9	32	33	36	36	45	25	21	32	17	17	21	14	329
70–4	67	48	47	51	50	51	42	29	42	44	30	48	549
65–9	39	40	53	53	51	53	44	63	42	50	51	32	571
60 4	34	25	33	26	35	42	38	41	29	40	42	52	437
55 9	11	12	16	19	24	21	24	21	25	33	24	19	249
50–4	1	6	6	3	5	4	4	10	1	7	12	10	69
45–9	2				1	1	4	1		1	4	1	15
40–4								1				1	2
Total	217	199	235	220	252	222	212	223	185	207	199	186	2557
Unknown	1		3	1	2		3	3		2		1	16
Grand Total	218	199	238	221	254	222	215	226	185	209	199	187	2573

TABLE 17—*continued*

Weight by Month of Birth for Month of Measurement

(*a*) Boys

Measured in July 1947

Weight in pounds	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +								1					1
115–9													
110–4													
105–9							1						1
100–4								1			1		2
95–9				1		1							2
90–4	1	1					2					1	5
85–9		1			1				1	1	1	1	6
80–4	4	3	1	3		1	2	1	2	2	1		20
75–9	5	9	5	2	6	5	7	1	1	2	1	3	47
70–4	7	8	4	5	11	4	6	7	3	2	4	4	65
65–9	7	6	8	5	7	4	3	5	5	3	8	5	66
60–4	4	6	4	7	7	5	4	8	4	8	6	4	67
55–9	5	3	3		4	4	4	3	1	4	5	1	37
50–4		1	1		3	1		1	5		2		14
49 –										1	2		3
Total	33	38	26	23	39	25	29	28	22	23	31	19	336
Unknown		1		1	1	1		1					5
Grand Total	33	39	26	24	40	26	29	29	22	23	31	19	341

Measured in August 1947

Weight in pounds	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +													
115–9													
110–4													
105–9													
100–4													
95–9													
90–4													
85–9													
80–4							1				1		2
75–9								1	1	1			3
70–4					1	1		1		1			4
65–9									1				1
60–4													
55–9													
50–4													
49 –													
Total					1	1	1	2	2	2	1		10
Unknown													
Grand Total					1	1	1	2	2	2	1		10

TABLE 17—*continued*

Weight by Month of Birth for Month of Measurement

(*a*) Boys

Measured in September 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
120 +													
115–9													
110–4								1					1
105–9													
100–4			1										1
95–9									1	1			2
90–4	2	1			1								4
85–9		1	1	1								1	4
80–4	3	2	4	2				1	1		3	1	17
75–9	4	2	2	2	1	4			1	1	4		21
70–4	1	3	5	1	2	2	2	1	1	1	5	1	25
65–9	2	2	2	2		2	3	1	2	1		4	21
60–4	4	1		3	1	2	1	1	1	2			16
55–9				2		1	2	2	1		2	1	11
50–4													
49 –						1							1
Total	16	12	15	13	5	12	8	7	8	6	14	8	124
Unknown													
Grand Total	16	12	15	13	5	12	8	7	8	6	14	8	124

Measured in October 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
120 +													
115–9													
110–4													
105–9													
100–4													
95–9			1										1
90–4					1								1
85–9	1												1
80–4													
75–9	1	2		1						2		1	7
70–4		1					1	1					3
65–9			1	2	2			1				1	7
60–4		1			1			1		1			4
55–9												1	1
50–4													
49 –													
Total	2	4	2	3	4		1	3		3		3	25
Unknown												1	1
Grand Total	2	4	2	3	4		1	3		3		4	26

TABLE 17—*continued*

WEIGHT BY MONTH OF BIRTH FOR MONTH OF MEASUREMENT

(*a*) Boys

Measured in November 1947

Weight in pounds	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +													
115–9													
110–4													
105–9									1				1
100–4													
95–9												1	1
90–4													
85–9													
80–4	1				1		1						3
75–9			1				1		2			1	5
70–4	1		1	1	1			1			3		8
65–9			2	1		1		1		1	1		7
60–4			1					1			1		3
55–9													
50–4													
49 –													
Total	2		5	2	2	1	2	3	3	1	5	2	28
Unknown	1		1	1		1	1		3		1	1	10
Grand Total	3		6	3	2	2	3	3	6	1	6	3	38

Measured in December 1947

NONE

TABLE 17—*continued*

Weight by Month of Birth for Month of Measurement

(*a*) Boys

Measured in January 1948

Weight in pounds	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +													
115–9													
110–4													
105–9			1										1
100–4													
95–9													
90–4													
85–9													
80–4			1		1	3		1			1	1	8
75–9						1	1	1			1		4
70–4		1	1	5	1	1	2						11
65–9			1					1			1		3
60–4							1	2		1		1	5
55–9						2					1		3
50–4													
49 –													
Total		1	4	5	2	7	4	5		1	4	2	35
Unknown	1												1
Grand Total	1	1	4	5	2	7	4	5		1	4	2	36

Measured in February 1948

Weight in pounds	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +										1			1
115–9													
110–4		1											1
105–9													
100–4													
95–9													
90–4													
85–9													
80–4					1					1	1		3
75–9				1	1						1	2	5
70–4							1						1
65–9							1						1
60–4													
55–9													
50–4							1						1
49 –													
Total		1		1	2		3			2	2	2	13
Unknown													
Grand Total		1		1	2		3			2	2	2	13

TABLE 17—*continued*

WEIGHT BY MONTH OF BIRTH FOR MONTH OF MEASUREMENT

(*a*) Boys

Measured in March 1948

Weight in pounds	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +						1							1
115–9													
110–4													
105–9		1											1
100–4	1	1	1	2							1		6
95–9	1												1
90–4			1		1			1					3
85–9	1							1	1	2			5
80–4	1	1			2	1		1			1	2	9
75–9			2		1	1	1	1	2	1	3		12
70–4	1		1		4	2	1	1	1	1	2	3	17
65–9	1		2		1		1	2	8	2	1	2	20
60–4			1							2	1		4
55–9					1		1				1	1	4
50–4													
49 –													
Total	6	3	8	2	10	5	4	7	12	8	10	8	83
Unknown				1	1							1	3
Grand Total	6	3	8	3	11	5	4	7	12	8	10	9	86

Measured in April 1948

Weight in pounds	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +													
115–9													
110–4													
105–9													
100–4													
95–9		1											1
90–4													
85–9	1												1
80–4	2			2						2			6
75–9			1						1				2
70–4	1						1	2					4
65–9											2	1	3
60–4					1						1		2
55–9												1	1
50–4												1	1
49 –													
Total	4	1	1	2	1		1	2	1	2	3	3	21
Unknown				1									1
Grand Total	4	1	1	3	1		1	2	1	2	3	3	22

TABLE 17—*continued*

WEIGHT BY MONTH OF BIRTH FOR MONTH OF MEASUREMENT

(*a*) Boys

Measured in May 1948

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +										1			1
115–9													
110–4													
105–9													
100–4													
95–9			1										1
90–4					1					1			2
85–9										1			1
80–4									1				1
75–9	1								1				2
70–4					1								1
65–9													
60–4		1											1
55–9													
50–4								1					1
49 –													
Total	1	1	1		2			1	2	3			11
Unknown													
Grand Total	1	1	1		2			1	2	3			11

Month of Measurement Unknown

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +													
115–9													
110–4													
105–9													
100–4													
95–9						1						1	2
90–4	1					1							2
85–9				1									1
80–4		1							1				2
75–9						2	1		1		2		6
70–4				1									1
65–9		1			1	1		1			1		5
60–4	2		1			1		2	1	1		1	9
55–9			1								1	2	4
50–4								1				1	2
49 –													
Total	3	2	2	2	1	6	1	4	3	1	4	5	34
Unknown	14	12	16	17	11	16	11	20	12	14	15	19	177
Grand Total	17	14	18	19	12	22	12	24	15	15	19	24	211

TABLE 17

Weight by Month of Birth for Month of Measurement

(*b*) Girls

Measured in May 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
120 +													
115–9													
110–4													
105–9								1					1
100–4													
95–9	1					1				1			3
90–4				1		1		1		1		1	5
85–9	1					2	2	1	1	1		3	11
80–4	3	1	1	2	1	3	1	1	1	1		1	16
75–9	3	3	2	4	5	2	3						22
70–4	2	2	3	3	3	2	2	2	2	2		1	24
65–9	4	1	1	5	2	3		3	2	6	2	1	30
60–4	1	5	1	2	1	3	2	1	1	2	4	1	24
55–9		1	2	3	1	2	2	3	2	1		1	18
50–4								1					1
49 –		1	1							2			4
Total	15	14	11	20	13	19	12	14	9	17	6	9	159
Unknown		1						1	1		1		4
Grand Total	15	15	11	20	13	19	12	15	10	17	7	9	163

Measured in June 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
120 +	1	1		1	1				1	1	1		7
115–9		1		2		1		1	1				6
110–4	2	2				1			1			1	7
105–9	3		2	1	1	1	2				1		11
100–4	4	1	1	1		1	1	1	1				11
95–9	2	2	4	2	4	1	1	4		2	1		23
90–4	8	6	6	7	3	1	8	5	2	2	1	6	55
85–9	9	5	9	6	10	4	1	10	4	6	4		68
80–4	18	20	19	13	17	13	15	9	3	6	12	9	154
75–9	29	31	27	27	17	29	20	23	17	21	14	24	279
70–4	29	40	31	41	58	31	40	41	26	30	24	26	417
65–9	37	36	41	55	44	44	48	49	32	45	40	40	511
60–4	41	43	45	52	46	64	51	39	41	47	48	54	571
55–9	29	23	19	29	36	20	27	26	28	41	41	42	361
50–4	10	12	6	5	8	5	9	17	10	13	20	22	137
45–9	1		2	3	2	2	2	4		5	4	7	32
40–4		1		1		1		1			2	2	8
39 –					1								1
Total	223	224	212	246	248	219	225	230	167	219	213	233	2659
Unknown		1	3	1	1	1	3	3	3	3	2	1	22
Grand Total	223	225	215	247	249	220	228	233	170	222	215	234	2681

TABLE 17—*continued*

Weight by Month of Birth for Month of Measurement

(*b*) Girls

Measured in July 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +													
115–9													
110–4													
105–9							1						1
100–4	1	2											3
95–9			1										1
90–4	1	1	1		1	1	1	1	1				8
85–9	1			1	3	2	1	2	1		1	1	13
80–4	2	2	1	4	2	1	4	2		1		1	20
75–9	4	3	4	1	3	4	4		4	2	1	3	33
70–4	5	5	3	8	5	7	7	7	7	5	2	1	62
65–9	9	6	7	5	7	4	6	4	3	1	3	3	58
60–4	4	4	8	7	3	6	8	5	5	3	5	5	63
55–9	6	2	5	5		5	6	4	4	2	4	4	47
50–4	1		1		1		2	1	2	2	1	2	13
49 –			1			1			2				4
Total	34	25	32	31	25	31	40	26	29	16	17	20	326
Unknown	1		2		1	2			1				7
Grand Total	35	25	34	31	26	33	40	26	30	16	17	20	333

Measured in August 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +													
115–9													
110–4													
105–9													
100–4													
95–9													
90–4													
85–9		1	2										3
80–4			1										1
75–9											1		1
70–4			1			1					1		3
65–9		1		1				1		1			4
60–4										1		1	2
55–9				1						1	1		3
50–4													
49 –													
Total		2	4	2		1		1		3	3	1	17
Unknown													
Grand Total		2	4	2		1		1		3	3	1	17

TABLE 17—*continued*

Weight by Month of Birth for Month of Measurement

(*b*) Girls

Measured in September 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
120 +													
115–9													
110–4			1										1
105–9						1							1
100–4							1		1				2
95–9												2	2
90–4				2					2				4
85–9	1	1	1		1				1		1		6
80–4	2	1		3	1	2	1		1				11
75–9	1	4	2	2	3	3	2	2		2	1	1	23
70–4	1	2	3	2	5	3	3	5		1	1	1	27
65–9	3	2	1	1	1	3	2	3	1	2	2	3	24
60–4	1		1	2	2	1	1		3		3	2	16
55–9	2		1	1			3			3	2	1	13
50–4		2		1		2			2	1			8
49 –	2							1					3
Total	13	12	10	14	13	15	13	11	11	9	10	10	141
Unknown		1		1									2
Grand Total	13	13	10	15	13	15	13	11	11	9	10	10	143

Measured in October 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
120 +													
115–9													
110–4													
105–9													
100–4													
95–9													
90–4								1					1
85–9							1					1	2
80–4	1			1			1						3
75–9			1			1			2	1			5
70–4			1	1		1			1		1		5
65–9	1			1			1	2		1			6
60–4							3	1					4
55–9			1		1				1		1		4
50–4							1		1				2
49 –								1					1
Total	2		3	3	1	2	7	5	5	2	2	1	33
Unknown													
Grand Total	2		3	3	1	2	7	5	5	2	2	1	33

TABLE 17—*continued*

Weight by Month of Birth for Month of Measurement

(*b*) Girls

Measured in November 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
120 +													
115–9													
110–4													
105–9													
100–4													
95–9													
90–4													
85–9		1	1	1									3
80–4					1		2		1	1		1	6
75–9		1	1					1					3
70–4				1	1	1	1	1		1			6
65–9	1				1							1	3
60–4				1							1		2
55–9												1	1
50–4							1				1		2
49 –													
Total	1	2	2	3	3	1	4	2	1	2	2	3	26
Unknown	2	2		1	3	2			1		1		12
Grand Total	3	4	2	4	6	3	4	2	2	2	3	3	38

Measured in December 1947

Weight in pounds	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
	Month of Birth												
120 +													
115–9													
110–4													
105–9													
100–4													
95–9													
90–4													
85–9													
80–4													
75–9													
70–4													
65–9			1										1
60–4													
55–9													
50–4													
49 –			1										1
Total			2										2
Unknown													
Grand Total			2										2

TABLE 17—*continued*

Weight by Month of Birth for Month of Measurement

(*b*) Girls

Measured in January 1948

Weight in pounds	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +													
115–9													
110–4													
105–9							1						1
100–4													
95–9			1										1
90–4										1			1
85–9					1						1		2
80–4						1					1	4	6
75–9							1				1	3	5
70–4	2						1		1	1			5
65–9	1	1	1					2	1	2			8
60–4			1				1	1			1	3	7
55–9													
50–4					1			1	1	1	1	1	6
49 –													
Total	3	1	3		2	1	4	4	3	5	5	11	42
Unknown								1					1
Grand Total	3	1	3		2	1	4	5	3	5	5	11	43

Measured in February 1948

Weight in pounds	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +													
115–9													
110–4													
105–9													
100–4													
95–9													
90–4										1			1
85–9		1											1
80–4													
75–9	1		1				1			1			4
70–4							1						1
65–9							1		1				2
60–4					2							1	3
55–9													
50–4													
49–													
Total	1	1	1		2		3		1	2		1	12
Unknown													
Grand Total	1	1	1		2		3		1	2		1	12

TABLE 17—*continued*

Weight by Month of Birth for Month of Measurement

(*b*) Girls

Measured in March 1948

Weight in pounds	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +										1			1
115–9													
110–4													
105–9					1					1			2
100–4			1										1
95–9	1							1					2
90–4					1		1					1	3
85–9			2		1			1			1		5
80–4			2	1				1				2	6
75–9			2		2	1			2	2		1	10
70–4			2		2	2		1		1	3		11
65–9				3		1	1	1	2	1	2	3	14
60–4	1	1			1			3	1		1	1	9
55–9										1			1
50–4													
49 –													
Total	2	1	9	4	8	4	2	8	5	7	7	8	65
Unknown	1		1		1		1	2				1	7
Grand Total	3	1	10	4	9	4	3	10	5	7	7	9	72

Measured in April 1948

Weight in pounds	*Month of Birth* *Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Total*
120 +													
115–9													
110–4													
105–9													
100–4				1			1			1			3
95–9													
90–4											1		1
85–9													
80–4												1	1
75–9									1			1	2
70–4		1	3		2							1	7
65–9		1	1			1		1		3			7
60–4						1	1					3	5
55–9									1				1
50–4							1						1
49 –													
Total		2	4	1	2	2	3	1	2	4	1	6	28
Unknown							1						1
Grand Total		2	4	1	2	2	4	1	2	4	1	6	29

T

TABLE 17—*continued*

WEIGHT BY MONTH OF BIRTH FOR MONTH OF MEASUREMENT

(*b*) Girls

Measured in May 1948

Weight in pounds	*Month of Birth* Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
120 +													
115-9													
110-4		1											1
105-9													
100-4													
95-9													
90-4													
85-9													
80-4						1		1	1				3
75-9		1											1
70-4											1		1
65-9										1			1
60-4													
55-9													
50-4													
49 –													
Total		2				1		1	1	1	1		7
Unknown													
Grand Total		2				1		1	1	1	1		7

Month of Measurement Unknown

Weight in pounds	*Month of Birth* Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
120 +													
115-9		1											1
110-4								1					1
105-9													
100-4													
95-9								1			2		3
90-4							1	1					2
85-9			1										1
80-4	1		1			1						1	4
75-9					1								1
70-4		1		1		1	1	1	1		1		7
65-9					1	1	1		1		2	1	7
60-4		1			1	2			1	1	1	3	10
55-9				1	1		2	1	2			1	8
50-4									1				1
49 –													
Total	1	3	2	2	4	5	5	5	6	1	6	6	46
Unknown	4	8	8	1	12	2	9	10	6	5	7	15	87
Grand Total	5	11	10	3	16	7	14	15	12	6	13	21	133

TABLE 18

Weight by Age at Date of Measurement

(a) Boys

Age in Months

Weight in pounds	125½	126½	127½	128½	129½	130½	131½	132½	133½	134½	135½	136½
120 +				1			1		1			2
115–9									1			
110–4						1	2		1	1	1	
105–9					1	1	1	1		1		1
100–4				1		2	1		1		3	1
95–9		1			2	2	2	2	4	5	4	3
90–4		1	3	3	3	4	6	5	4	3	5	5
85–9		2	4	3	9	5	11	5	16	8	12	8
80–4		5	11	13	24	19	21	21	22	22	32	26
75–9		17	27	23	23	42	28	40	53	52	45	45
70–4	5	49	38	48	47	40	53	63	57	66	66	57
65–9	3	35	59	59	52	73	54	63	62	67	65	53
60–4	4	53	50	48	41	46	53	50	44	36	48	34
55–9	1	19	27	39	30	26	28	27	30	27	18	17
50–4	1	11	12	11	3	16	6	4	6	6	6	8
45–9		1	4	2	1	1	4	1	1			
40–4		1		1		1					1	
39 –												
Total	14	195	235	252	236	279	271	282	303	294	306	260
Unknown		1		2		4	5	1	3	5	5	1
Grand Total	14	196	235	254	236	283	276	283	306	299	311	261

Age in Months—continued

Weight in pounds	137½	138½	139½	140½	141½	142½	143½	144½	145½	146½	147½	*Total*
120 +			1		1							7
115–9												1
110–4	1							1				8
105–9						1			1			8
100–4	1	1					2	1	1	1		16
95–9	1		1							3		30
90–4	5	1	3	2		1		2				56
85–9	14	2	3		1					1	1	105
80–4	21	11	6	5	2	4		2	1	1	2	271
75–9	45	11	5	9	3	2		2	1			473
70–4	77	16	7	7	8	6	1	2		1	1	715
65–9	55	19	7	5		2		2		1		736
60–4	49	5	1	6			1	1			1	571
55–9	16	5	2	1		1						314
50–4	2		1		1							94
45–9	2											17
40–4												4
39 –												
Total	289	71	37	35	16	17	4	13	4	8	5	1426
Unknown	3		1	1		2	1	2				37
Grand Total	292	71	38	36	16	19	5	15	4	8	5	1463

TABLE 18—*continued*

Weight by Age at Date of Measurement

(*b*) Girls

Age in Months

Weight in pounds	125½	126½	127½	128½	129½	130½	131½	132½	133½	134½	135½	136½
120 +			1	1	1				1	1		1
115–9					1					2		1
110–4		1			1	1		1				2
105–9			1		1		2	3	1	1	3	
100–4					1	1	1	2		2	1	1
95–9			2	2	2	4	2	1	4	2	4	4
90–4	1	6	2	2	3	6	10	4	5	9	8	8
85–9	3		6	8	5	8	6	8	12	10	11	8
80–4	1	9	14	7	5	18	20	17	25	19	29	28
75–9	1	24	17	22	21	31	24	38	32	35	36	44
70–4	1	26	27	34	35	51	51	41	75	53	46	57
65–9	1	42	49	50	39	55	58	55	56	67	56	52
60–4	1	58	55	54	47	49	59	77	58	60	61	58
55–9		42	46	47	35	35	35	27	44	35	26	30
50–4		22	22	14	13	19	14	10	11	6	9	14
45–9		7	6	5	1	6	2	2	3	4	3	1
40–4		2	2			1		1	1	2		1
39–									1			
Total	9	239	250	246	211	285	284	287	329	308	293	310
Unknown		2	2	3	4	4	3	3	2	3	5	3
Grand Total	9	241	252	249	215	289	287	290	331	311	298	313

Age in Months—continued

Weight in pounds	137½	138½	139½	140½	141½	142½	143½	144½	145½	146½	147½	*Total*
120 +	2							1				9
115–9												4
110–4	2	1									1	10
105–9	4					1						17
100–4	6	2			1			2				20
95–9	3					1				1		32
90–4	12	1		1		1						79
85–9	14	3	3	3	1	1	1	3				114
80–4	21	4	3	3	2		1	2				228
75–9	36	9	7	2	2	2	1	2	1		1	388
70–4	39	12	6	1	2	2	2	4	3	1		569
65–9	48	18	5	5	3	3	4	1	1	1		669
60–4	47	8	4	1	4	3			1	1		706
55–9	35	7	2	3								449
50–4	11	1	2		1							169
45–9	1			2	1							44
40–4												10
39 –												1
Total	281	66	32	21	17	14	9	15	6	4	2	3518
Unknown	4	5	4	1	3	3				1		55
Grand Total	285	71	36	22	20	17	9	15	6	5	2	3573

TABLE 18—*continued*

Weight by Age at Date of Measurement

w = weight in units of five pounds with origin at 62·0 pounds
y = age in units of one month with origin at 124·5 months
b_{wy} = regression of weight on age
r_{wy} = correlation of weight and age

Boys ($n = 3{,}426$)

$\Sigma w = 5546$	$\Sigma w^2 = 22808$	$\Sigma' w^2 = 13830{\cdot}15$
$\Sigma y = 28432$	$\Sigma y^2 = 287720$	$\Sigma' y^2 = 51765{\cdot}94$
	$\Sigma wy = 51804$	$\Sigma' wy = 5778{\cdot}35$
$b_{wy} = +0{\cdot}112$	$r_{wy} = +0{\cdot}216$	

Girls ($n = 3{,}518$)

$\Sigma w = 4752$	$\Sigma w^2 = 24490$	$\Sigma' w^2 = 18071{\cdot}15$
$\Sigma y = 28919$	$\Sigma y^2 = 289851$	$\Sigma' y^2 = 52128{\cdot}27$
	$\Sigma wy = 44788$	$\Sigma' wy = 5725{\cdot}15$
$b_{wy} = +0{\cdot}110$	$r_{wy} = +0{\cdot}187$	

Boys Measured in June*
($n = 2{,}557$)

$\Sigma w = 3858$	$\Sigma w^2 = 15114$	$\Sigma' w^2 = 9293{\cdot}05$
$\Sigma y = 17025$	$\Sigma y^2 = 142665$	$\Sigma' y^2 = 29309{\cdot}27$
	$\Sigma wy = 28584$	$\Sigma' wy = 2896{\cdot}68$
$b_{wy} = +0{\cdot}099$	$r_{wy} = +0{\cdot}176$	

* See Table 17A

Girls Measured in June*
($n = 2{,}659$)

$\Sigma w = 3268$	$\Sigma w^2 = 17340$	$\Sigma' w^2 = 13323{\cdot}52$
$\Sigma y = 17475$	$\Sigma y^2 = 146523$	$\Sigma' y^2 = 31676{\cdot}96$
	$\Sigma wy = 24923$	$\Sigma' wy = 3445{\cdot}64$
$b_{wy} = +0{\cdot}109$	$r_{wy} = +0{\cdot}168$	

* See Table 17B

TABLE 19

Weight by Size of Family

(a) Boys

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Un-known*	*Grand Total*
120+	1	3	1			2											7		7
115–9			1														1		1
110–4	1	4	2	1													8		8
105–9	3	1	1	2	1												8		8
100–4	3	5	3	3	1		1										16		16
95–9	4	8	6	6	3	3											30		30
90–4	12	17	15	5	1		1	1	1			1	1				55	1	56
85–9	20	25	25	16	9	6	2	1			1						105		105
80–4	33	64	70	37	26	11	11	6	5	5	1	1					270	1	271
75–9	53	125	106	69	48	31	19	11	7	3	1						473		473
70–4	86	160	147	113	77	49	33	22	11	3	4	1	1	1	1		709	6	715
65–9	69	142	145	134	86	55	38	36	13	3	8	1	2			1	733	3	736
60–4	50	117	108	108	59	51	26	19	12	11	1	2	1				565	6	571
55–9	34	53	65	60	32	24	20	8	6	5	3	1					311	3	314
50–4	10	12	23	11	13	9	3	3	2	4	1			1			92	2	94
45–9	1	4	3	4	2	2							1				17		17
40–4		1	1	1			1										4		4
39–																			
Total	380	741	722	570	358	243	155	107	57	34	20	7	6	2	1	1	3404	22	3426
Unknown	5	5	6	6	7	3	3		1	1							37		37
Grand Total	385	746	728	576	365	246	158	107	58	35	20	7	6	2	1	1	3441	22	3463

(b) Girls

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Un-known*	*Grand Total*
120+	1	2	1		1	1	1		1								8	1	9
115–9	1	1	1	1													4		4
110–4	3	3	1	1	2												10		10
105–9	2	6	6	2	1												17		17
100–4	2	5	7	2		1	1	1		1							20		20
95–9	5	10	7	2	4	1			1	1							31	1	32
90–4	16	18	13	11	9	1	8		1	2							79		79
85–9	25	22	27	14	12	5	3	4	1								113	1	114
80–4	42	64	36	33	18	14	8	6	3	3				1			228		228
75–9	52	91	87	71	30	20	10	10	2	6	3				1		383	5	388
70–4	67	141	112	91	66	36	23	11	10	5	1	1	2	1			567	2	569
65–9	67	163	144	101	62	43	38	28	9	4	2	3			1		665	4	669
60–4	62	137	150	110	75	60	35	22	22	10	9	3	2	1	1		699	7	706
55–9	40	85	80	63	60	43	28	19	10	11	4				1		444	5	449
50–4	8	27	39	32	24	9	9	7	4	4	3	1					167	2	169
45–9	2	5	8	7	6	4	5	6		1							44		44
40–4			2	2	1	2	1	1	1								10		10
39–																			
Total	396	780	721	543	371	240	170	115	65	48	22	8	4	3	4		3490	28	3518
Unknown	5	10	6	5	9	2	9	3	4	2							55		55
Grand Total	401	790	727	548	380	242	179	118	69	50	22	8	4	3	4		3545	28	3573

TABLE 19—*continued*

WEIGHT BY SIZE OF FAMILY

x = weight in units of five pounds with origin at 62·0 pounds
y = size of family in units
b = regression of weight on size of family

Boys

	Size of Family									
	1	2	3	4	5	6	7	8	9 +	*Unknown*
n	380	741	722	570	358	243	155	107	128	22
Σx	748	1408	1246	821	513	317	199	134	142	18
Σx^2	3308	5946	5204	3283	1897	1369	715	400	596	90
Mean in pounds	72·09	71·75	70·88	69·45	69·41	68·77	68·67	68·51	67·80	66·34

Overall mean for weight: 70·34 pounds
Overall variance for weight: 100·92 (pounds)^2

Excluding the cases where size of family is not known:

n = 3404 Σx = 5528 Σy = 12680
Σx^2 = 22718 Σy^2 = 63580 Σxy = 18709
b = 0·576 lb per size of family
or b = 0·057 σ units per size of family

Girls

	Size of Family									
	1	2	3	4	5	6	7	8	9 +	*Unknown*
n	396	780	721	543	371	240	170	115	154	28
Σx	801	1267	988	677	409	208	164	77	123	38
Σx^2	3891	6011	5076	3273	2355	1156	1044	539	857	288
Mean in pounds	72·36	70·37	69·10	68·48	67·76	66·58	67·07	65·60	66·24	68·44

Overall mean for weight: 69·00 pounds
Overall variance for weight: 128·42 (pounds)^2

Excluding the cases where size of family is not known:

n = 3490 Σx = 4714 Σy = 13231
Σx^2 = 24202 Σy^2 = 67761 Σxy = 15274
b = 0·740 lb per size of family
or b = 0·065 σ units per size of family

TABLE 20

Weight by Father's Occupation

(a) Boys

Weight in pounds	*Father's Occupation* 10	20	30	41	42	51	52	61	62	6x	63	70	80	*Total*	*Unknown*	*Grand Total*
120 +		1	2					2					1	6	1	7
115–9			1											1		1
110–4			1	2	1		1					1	2	8		8
105–9	1		1				1	1			1	1	1	7	1	8
100–4		1	2	1			3	3	1	1	1		2	15	1	16
95–9			2	3	1	1	2	10	3		2	2	4	30		30
90–4	4	4	5	4		2	4	10	4	1	7	3	7	55	1	56
85–9	6	2	6	7		3	10	37	13	1	9	2	7	103	2	105
80–4	8	4	16	12	1	8	19	99	29	7	34	6	21	264	7	271
75–9	17	9	23	19	3	15	31	162	55	16	68	14	31	463	10	473
70–4	24	7	35	17	4	8	43	254	92	27	110	17	60	698	17	715
65–9	12	7	27	22	3	11	28	265	120	28	147	5	45	720	16	736
60–4	2	3	26	15	3	11	27	216	86	22	116	9	26	562	9	571
55–9	1	2	20	2	1	3	14	118	46	15	70	3	10	305	9	314
50–4			5			2	3	30	16	2	26	3	5	92	2	94
45–9							2	5	3	2	4		1	17		17
40–4								1	3					4		4
39 –																
Total	75	40	172	104	17	64	188	1213	471	122	595	66	223	3350	76	3426
Unknown	2	1	1	1	1		1	10	4	1	5	2	7	36	1	37
Grand Total	77	41	173	105	18	64	189	1223	475	123	600	68	230	3386	77	3463

(b) Girls

Weight in pounds	*Father's Occupation* 10	20	30	41	42	51	52	61	62	6x	63	70	80	*Total*	*Unknown*	*Grand Total*
120 +	1	1	1					2					3	8	1	9
115–9			3				1							4		4
110–4	1		1				1	2	2		1		2	10		10
105–9			3	1			1	4	3	1	1	1	2	17		17
100–4	1		2	1	1		2	6			4	1	2	20		20
95–9			1				4	14	2	1		3	4	29	3	32
90–4	3	1	8	3		3	7	23	3	2	12	4	7	76	3	79
85–9	4	2	8	10	1	5	8	26	18	6	14	2	7	111	3	114
80–4	5	5	12	5	1	12	15	71	32	7	28	8	18	219	9	228
75–9	9	4	20	11	3	7	19	147	57	13	47	8	33	378	10	388
70–4	14	5	17	23	5	14	34	201	76	25	85	13	39	551	18	569
65–9	22	10	30	19	2	17	43	245	86	26	109	11	38	658	11	669
60–4	7	7	25	14	4	9	39	254	104	34	148	12	34	691	15	706
55–9	7	3	23	10	3	11	31	151	64	15	100	5	16	439	10	449
50–4		1	6	3	1	4	13	63	34	3	30	2	4	164	5	169
45–9						1	3	12	11	1	13		1	42	2	44
40–4							1	2	2	1	4			10		10
39 –								1						1		1
Total	74	39	160	100	21	83	222	1224	494	135	596	70	210	3428	90	3518
Unknown	1		3	3			5	13	9	1	5	1	9	50	5	55
Grand Total	75	39	163	103	21	83	227	1237	503	136	601	71	219	3478	95	3573

TABLE 20—*continued*

WEIGHT BY FATHER'S OCCUPATION

x = weight in units of five pounds with origin at 62·0 pounds

Boys

Father's Occupation

	10	20	30	41	42	51	52	61	62	6x	63	70	80	*Unknown*
n	75	40	172	104	17	64	188	1213	471	122	595	66	223	76
Σx	205	116	344	267	40	131	388	1830	604	152	691	157	481	140
Σx^2	765	584	1816	1185	212	513	1692	6958	2312	494	2673	747	1987	688
Mean in pounds	75·92	76·75	72·25	75·09	74·01	72·48	72·57	69·79	68·66	68·48	68·06	74·14	73·03	71·46
	76·21		72·25	74·94		72·55		69·79	68·62		68·06	74·14	73·03	71·46
Variance in (pounds)^2	98·48		163·95	127·70		112·71		86·50	80·36		78·59	141·49	121·19	141·48

Overall mean for weight: 70·34 pounds
Overall variance for weight: 100·92 (pounds)^2

Girls

Father's Occupation

	10	20	30	41	42	51	52	61	62	6x	63	70	80	*Unknown*
n	74	39	160	100	21	83	227	1224	494	135	596	70	210	90
Σx	158	75	330	187	33	135	314	1540	538	173	510	156	455	153
Σx^2	762	383	2032	815	161	597	1794	7436	2845	759	2940	762	2365	839
Mean in pounds	72·93	71·87	72·56	71·60	70·11	70·38	69·32	68·45	67·70	68·66	66·53	73·39	73·08	70·75
	72·56		72·56	71·34		69·61		68·45	67·90		66·53	73·39	73·08	70·75
Variance in (pounds)^2	147·04		211·15	119·01		141·80		112·30	111·30		105·02	147·98	164·19	175·81

Overall mean for weight: 69·00 pounds
Overall variance for weight: 128·42 (pounds)^2

TABLE 21

Weight by Occupancy Rate

(a) Boys

Weight in pounds	Occupancy Rate 1	2	3	4	Unknown	Grand Total
120 +	2	2	2	1		7
115–19	1					1
110–14	3	3	2			8
105–9	3	4		1		8
100–4	3	6	4	2	1	16
95–9	4	16	7	2	1	30
90–4	16	28	9	3		56
85–9	19	48	25	11	2	105
80–4	26	127	77	39	2	271
75–9	47	217	148	56	5	473
70–4	71	305	196	139	4	715
65–9	43	291	236	163	3	736
60–4	30	226	189	120	6	571
55–9	13	117	99	81	4	314
50–4	3	30	35	26		94
45–9	1	4	5	7		17
40–4		1	2	1		4
Unknown	4	16	9	6	2	37
Grand Total	289	1441	1045	658	30	3463

(b) Girls

Weight in pounds	Occupancy Rate 1	2	3	4	Unknown	Grand Total
120 +	2	7				9
115–19		4				4
110–14	2	5	3			10
105–9	4	10	1	2		17
100–4	3	10	3	4		20
95–9	4	15	7	4	2	32
90–4	11	41	16	10	1	79
85–9	17	50	27	18	2	114
80–4	33	104	64	23	4	228
75–9	39	175	120	53	1	388
70–4	50	242	184	88	5	569
65–9	61	278	204	120	6	669
60–4	38	264	240	159	5	706
55–9	21	160	156	108	4	449
50–4	6	56	60	46	1	169
45–9	1	11	17	15		44
40–4		2	4	4		10
39 –	1					1
Unknown	6	21	15	9	4	55
Grand Total	299	1455	1121	663	35	3573

TABLE 21—*continued*

WEIGHT BY OCCUPANCY RATE

x = weight in units of five pounds with origin at 62·0 pounds

(*a*) Boys

	Occupancy Rate				
	1	2	3	4	*Unknown*
n	285	1425	1036	652	28
Σx	743	2525	1492	731	55
Σx^2	3591	10073	5936	2945	263
Mean in pounds	75·29	71·11	69·45	67·86	72·25
Variance in (pounds²)	145·09	98·26	81·34	81·34	138·36

Overall mean for weight: 70·34 pounds
Overall variance for weight: 100·92 (pounds)²

(*b*) Girls

	Occupancy Rate				
	1	2	3	4	*Unknown*
n	293	1434	1106	654	31
Σx	652	2339	1118	514	59
Σx^2	3240	11903	5824	3232	291
Mean in pounds	73·13	70·16	67·37	65·93	71·77
Variance in (pounds)²	152·66	141·00	102·80	108·11	144·93

Overall mean for weight: 69·00 pounds
Overall variance for weight: 128·42 (pounds)²

TABLE 22

Weight by Date of Mother's Birth

(*a*) Boys

Weight in pounds	–1889	1890–4	1895–9	1900–4	1905–9	1910–14	1915–19	1920 +	*Total*	*Un-known*	*Grand Total*
	Date of Mother's Birth										
120 +			1	1	2	1	1		6	1	7
115–9			1						1		1
110–4				5	1	2			8		8
105–9		1		2	3		1		7	1	8
100–4		1	3	4	2	3	2		15	1	16
95–9		2	3	7	11	5	2		30		30
90–4		1	5	16	13	11	3	1	50	6	56
85–9			7	26	34	30	5		102	3	105
80–4	2	2	24	52	81	76	19	1	257	14	271
75–9	1	16	54	96	130	122	38	1	458	15	473
70–4	2	5	63	138	191	218	60	2	679	35	714
65–9	3	22	67	146	201	208	70		717	19	736
60–4	3	11	49	110	138	170	71	1	553	18	571
55–9		5	35	53	77	85	46	3	304	10	314
50–4		1	7	17	24	27	13		89	5	94
49 –			2	5	5	6	2	1	21		21
Total	11	67	321	678	913	964	333	10	3297	128	3425
Unknown			1	6	20	5			32	6	38
Grand Total	11	67	322	684	933	969	333	10	3329	134	3463

(*b*) Girls

Weight in pounds	–1889	1890–4	1895–9	1900–4	1905–9	1910–14	1915 19	1920 +	*Total*	*Un-known*	*Garnd Total*
	Date of Mother's Birth										
120 +		1	2	1	2	2			8	1	9
115–9			2	4					6		6
110–4			2	1	1	4			8	2	10
105–9			3	5	4	3	2		17		17
100–4			4	5	4	3	2		18	2	20
95–9		2	2	2	13	9	1		29	3	32
90–4		3	11	24	13	14	7	1	73	6	79
85–9		3	20	26	35	30	3		117		117
80–4		6	22	41	62	61	14		206	22	228
75–9	1	11	30	80	95	118	40	2	377	11	388
70–4		13	44	122	155	155	57	2	548	21	569
65–9	5	7	59	153	175	183	65		647	22	669
60–4	1	15	58	136	198	208	66	4	686	20	706
55–9	1	11	36	95	100	147	44	1	435	14	449
50–4		3	10	36	37	60	17		163	6	169
49 –		1	5	16	14	14	3	1	54		54
Total	8	76	310	747	908	1011	321	11	3392	130	3522
Unknown		1	5	11	4	13	7		41	10	51
Grand Total	8	77	315	758	912	1024	328	11	3433	140	3573

TABLE 22—*continued*

Weight by Date of Mother's Birth

Boys

x = weight in units of five pounds with origin at 62·0 pounds

	Date of Mother's Birth				
	−1899	1900–4	1905–9	1910–14	1915 +
n	399	678	913	964	343
Σx	664	1202	1558	1463	407
Σx^2	2794	5186	6272	5405	1837
Mean in pounds	70·57	71·11	71·08	69·84	68·18
Variance in (pounds)^2	105·83	113·09	98·94	82·59	98·62

Overall mean for weight: 70·34 pounds
Overall variance for weight: 100·92 (pounds)^2

Girls

	Date of Mother's Birth				
	−1899	1900–4	1905–9	1910–14	1915 +
n	394	747	908	1011	332
Σx	695	1028	1249	1195	379
Σx^2	3957	5458	5957	6329	1749
Mean in pounds	71·07	69·13	69·13	68·16	67·96
Variance in (pounds)^2	173·29	135·32	116·71	121·58	99·12

Overall mean for weight: 69·00 pounds
Overall variance for weight: 128·42 (pounds)^2

TABLE 23

Weight by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 10

Weight in pounds	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12 +	Total	Un-known	Grand Total
120 +		1											1		1
115–9		1											1		1
110–4															
105–9		1											1		1
100–4		1											1		1
95–9															
90–4	3	4											7		7
85–9	1	3	5		1								10		10
80–4	4	4	3	2									13		13
75–9	9	6	3	6		1	1						26		26
70–4	6	19	8	2	2								37	1	38
65–9	5	13	14	1		1							34		34
60–4	1	3	3	1		1							9		9
55–9	1	1	5	1									8		8
50–4															
49 –															
Total	30	57	41	13	3	3	1						148	1	149
Unknown	1	1		1									3		3
Grand Total	31	58	41	14	3	3	1						151	1	152

Father's Occupation Group 20

Weight in pounds	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12 +	Total	Un-known	Grand Total
120 +			1				1						2		2
115–9															
110–4															
105–9															
100–4		1											1		1
95–9															
90–4	1	2	1	1									5		5
85–9	2		1					1					4		4
80–4	1	3	4	1									9		9
75–9	1	6	5	1									13		13
70–4	3	4	1	1	1	2							12		12
65–9	5	6	2	1	1	1			1				17		17
60–4		6	1	1	1	1							10		10
55–9		3	1										4	1	5
50–4			1										1		1
49 –															
Total	13	31	18	6	3	4	1	1	1				78	1	79
Unknown						1							1		1
Grand Total	13	31	18	6	3	5	1	1	1				79	1	80

TABLE 23—*continued*

Weight by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 30

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
120 +	1	2											3		3
115–9		1	2	1									4		4
110–4	1		1										2		2
105–9		1	2	1									4		4
100–4		3	1										4		4
95–9	2		1										3		3
90–4	5	3	1	1	2		1						13		13
85–9	3	4	5	1	1								14		14
80–4	4	13	5	3	2	1							28		28
75–9	8	14	4	11	3	2							42	1	43
70–4	8	11	21	3	3	2	2	1	1				52		52
65–9	7	13	11	9	4	5	2	4			2		57		57
60–4	10	14	8	9	4	2	2			2			51		51
55–9	10	12	6	6		1	5						40	3	43
50–4	1	3	3	3		1							11		11
49 –															
Total	60	94	71	48	19	14	12	5	1	2	2		328	4	332
Unknown		1	2				1						4		4
Grand Total	60	95	73	48	19	14	13	5	1	2	2		332	4	336

Father's Occupation Groups 41 and 42

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
120 +															
115–9															
110–4		3											3		3
105–9		1											1		1
100–4	1		2										3		3
95–9	1	1	2										4		4
90–4	1	3	2		1								7		7
85–9	8	6	2	1			1						18		18
80–4	6	6	2	3	1			1					19		19
75–9	2	15	11	4	2		2						36		36
70–4	13	23	8	1	1		3						49		49
65–9	12	19	6	5	1	2	1						46		46
60–4	7	16	8	4	1								36		36
55–9	5	5	2	2	1						1		16		16
50–4		1	2					1					4		4
49 –															
Total	56	99	47	20	8	2	7	2			1		242		242
Unknown	2	1	1		1								5		5
Grand Total	58	100	48	20	9	2	7	2			1		247		247

TABLE 23—*continued*

Weight by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 51

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
120+															
115–9															
110–4															
105–9															
100–4															
95–9	1												1		1
90–4	1	1	3										5		5
85–9	2		3	2	1								8		8
80–4	5	10	2	2	1								20		20
75–9	7	9	6										22		22
70–4	4	7	7	1	2	1							22		22
65–9	4	9	10	1	3								27	1	28
60–4	2	4	5	4	2	1			1		1		20		20
55–9	3	2	7		1		1						14		14
50–4	3	2	1										6		6
49 –				1									1		1
Total	32	44	44	11	10	2	1		1		1		146	1	147
Unknown															
Grand Total	32	44	44	11	10	2	1		1		1		146	1	147

Father's Occupation Group 52

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
120+															
115–9	1												1		1
110–4		1	1										2		2
105–9	2												2		2
100–4		3		1			1						5		5
95–9		3	2	1									6		6
90–4	3	4	2	1	1								11		11
85–9	1	7	7		2	1							18		18
80–4	5	9	10	4	4				2				34		34
75–9	8	15	15	7	4				1				50		50
70–4	11	25	20	9	7	2	2					1	77		77
65–9	7	28	17	9	6	2	2						71		71
60–4	4	20	18	8	9		3		2		1		65	1	66
55–9	3	13	6	11	4	1	3	2	1				44	1	45
50–4	2	3	8	1	1	1							16		16
49 –			2		1	1		1	1				6		6
Total	47	131	108	52	39	8	11	3	7		1	1	408	2	410
Unknown	2		2					1	1				6		6
Grand Total	49	131	110	52	39	8	11	4	8		1	1	414	2	416

TABLE 23—*continued*

Weight by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 61

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
120+	1				1	2							4		4
115–9															
110–4	1				1								2		2
105–9	1	3	1										5		5
100–4	1	2	2	2		1	1						9		9
95–9	2	10	2	2	4	3				1			24		24
90–4	6	8	9	2	3	1	2		1	1			33		33
85–9	16	18	10	14	3	2	2	1	1				67	1	68
80–4	25	41	39	18	18	11	5	3	4	1			165		165
75–9	33	96	68	48	26	12	10	4	4	2	1	1	305	4	309
70–4	60	107	95	78	48	33	15	6	9	2		2	455	1	456
65–9	48	119	104	94	57	35	16	19	6	1	1	1	501	2	503
60–4	42	108	111	80	39	40	18	13	7	7	5	4	474	4	478
55–9	31	57	50	39	35	6	14	6	3	6	4	1	252	1	253
50–4	4	16	22	15	19	22	2	2	2	1	2	2	109		109
49 –	3	5	5	3	1		1	2				1	21		21
Total	274	590	518	395	255	168	86	56	37	22	13	12	2426	13	2439
Unknown	3	6	2	1	6		1		2				21		21
Grand Total	277	596	520	396	261	168	87	56	39	22	13	12	2447	13	2460

Father's Occupation Group 62

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
120+															
115–9															
110–4		1		1									2		2
105–9	1	1			1								3		3
100–4	1												1		1
95–9		4		1									5		5
90–4	1	2		2	1		1						7		7
85–9	8	2	8	6	3	2	1	1					31		31
80–4	7	14	10	13	7	4	2	1	1	1		1	61		61
75–9	7	21	24	18	14	10	6	5	2	3	2		112		112
70–4	12	31	32	33	24	11	11	12	1	1	1		169		169
65–9	14	33	46	35	32	15	9	13	4	2	2	1	206		206
60–4	10	38	28	30	27	19	14	6	7	4	2	3	188	2	190
55–9	6	11	23	21	21	9	7	5	1	5	1		110		110
50–4	1	5	12	6	8	3	3	5	3	3			49	1	50
49 –		2	3	4	1	3	4	1		1			19		19
Total	68	165	186	170	139	76	58	49	19	20	8	5	963	3	966
Unknown		1	2	2	3		3	1		1			13		13
Grand Total	68	166	188	172	142	76	61	50	19	21	8	5	976	3	979

U

TABLE 23—*continued*

Weight by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 6x

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
120+															
115–9															
110–4					1								1		1
105–9			1										1		1
100–4				1									1		1
95–9	1												1		1
90–4	1		1	1									3		3
85–9	1	2	1	1	1	1		1					8		8
80–4	1	3	4	3	2								13		13
75–9	2	5	8	5	2	4		2		1			29		29
70–4	3	11	10	13	3	6	3		1				50	2	52
65–9	5	9	21	5	5	2	3	1		1	1		53	1	54
60–4	9	5	7	7	6	11	4	3		1		2	55	1	56
55–9		4	6	6	1	4	5		1	3			30		30
50–4				1		2							3	2	5
49 –				1	2	1							4		4
Total	23	39	59	44	23	31	15	7	2	6	1	2	252	6	258
Unknown			1				1						2		2
Grand Total	23	39	60	44	23	31	16	7	2	6	1	2	254	6	260

Father's Occupation Group 63

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
120+															
115–9				1									1		1
110–4			1										1		1
105–9				1									1		1
100–4			2	1				1		1			5		5
95–9				2									2		2
90–4	3	3	3	2	1		4	1		1		1	19		19
85–9	3	5	5	4	2	2	1						22		22
80–4	8	9	12	11	4	3	6	5		2	1	1	62		62
75–9	11	11	24	27	16	14	7	2	2	1			115		115
70–4	11	33	28	41	26	20	12	10	3	3	3	3	193	1	194
65–9	15	33	41	47	29	18	35	23	5	2	3	3	254	2	256
60–4	16	21	45	60	33	34	16	18	10	5		1	259	4	263
55–9	8	19	32	27	23	26	10	12	9	2	1	1	170	1	171
50–4	4	9	5	13	5	5	7	2	1	4	1		56	1	57
49 –		2	3	4	4	3	2	3					21		21
Total	79	145	201	241	143	125	100	77	30	21	9	10	1181	9	1190
Unknown				2	4	1	1		2				10		10
Grand Total	79	145	201	243	147	126	101	77	32	21	9	10	1191	9	1200

TABLE 23—*continued*

Weight by Size of Family for Father's Occupation

Boys and Girls

Father's Occupation Group 70

Weight in pounds	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
120 +															
115–9															
110–4	1												1		1
105–9			1	1									2		2
100–4	1												1		1
95–9			2		1	1			1				5		5
90–4	2	2	2										6	1	7
85–9			1		2	1							4		4
80–4		3	3	2		1	3	1		1			14		14
75–9	1	5	6	3	2			3		1	1		22		22
70–4	2	10	4	4	8	1						1	30		30
65–9	1	4	4	4			1	1				1	16		16
60–4	1	2	5	6	3	2	1	1					21		21
55–9		3	1	1	1	1	1						8		8
50–4	2			1			1				1		5		5
49 –															
Total	11	29	29	22	17	7	7	6	1	2	2	2	135	1	136
Unknown		1		1						1			3		3
Grand Total	11	30	29	23	17	7	7	6	1	3	2	2	138	1	139

Father's Occupation Group 80

Weight in pounds	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
120 +		1	1			1			1				4		4
115–9															
110–4	1	1											2		2
105–9			2		1								3		3
100–4			3	1	1								5		5
95–9			4	2	2								8		8
90–4	1	2	3	4	1		1		1			1	14		14
85–9	2	2	4		5			1			1		15		15
80–4	3	8	7	5	5	3	3	1	1	2			38		38
75–9	10	9	14	10	8	6	1	5		1			64		64
70–4	12	13	17	17	14	5	6	3	6	1	1	1	96	3	99
65–9	7	11	9	19	9	10	4	3	6	1	1	2	82	1	83
60–4	5	13	12	7	6	4	4	1	6	1	1		60		60
55–9	2	5	3	6	3	3	2		1				25	1	26
50–4	1		4	3	1								9		9
49 –		1	1										2		2
Total	44	66	84	74	56	32	21	14	22	6	4	4	427	5	432
Unknown	1	3	2	1	2	2	5						16		16
Grand Total	45	69	86	75	58	34	26	14	22	6	4	4	443	5	448

TABLE 23—*continued*

Weight by Size of Family for Father's Occupation

x = weight in units of five pounds with origin at 62·0 pounds

Father's Occupation		Size of Family 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*
10	n	30	57	41	13	7*								148	1
	$\sum x$	82	163	71	30	16								362	2
	$\sum x^2$	308	837	251	96	52								1544	4
	Mean in pounds	75·92	76·55	70·91	73·79	73·68									
	Overall mean for weight: 74·55 pounds														
20	n	13	31	18	16*									78	1
	$\sum x$	34	61	55	42									192	−1
	$\sum x^2$	128	263	325	250									966	1
	Mean in pounds	75·33	72·09	77·53	75·38										
	Overall mean for weight: 74·55 pounds														
30	n	60	94	71	48	19	14	12	10*					328	4
	$\sum x$	132	217	169	79	44	16	7	10					674	—
	$\sum x^2$	786	1305	1007	449	172	52	51	14					3836	12
	Mean in pounds	73·25	73·79	74·15	70·48	73·83	67·96	65·17	67·25						
	Overall mean for weight: 72·52 pounds														
41, 42	n	56	99	47	20	20*								242	
	$\sum x$	124	221	109	34	39								527	
	$\sum x^2$	532	1039	527	120	155								2373	
	Mean in pounds	73·31	73·41	73·85	70·75	72·00									
	Overall mean for weight: 73·14 pounds														
51	n	32	44	44	11	10	5*							146	1
	$\sum x$	67	90	74	18	15	1							265	1
	$\sum x^2$	313	324	318	96	53	5							1109	1
	Mean in pounds	72·72	72·48	70·66	70·43	69·75	63·25								
	Overall mean for weight: 71·33 pounds														
52	n	47	131	108	52	39	8	11	12*					408	2
	$\sum x$	118	254	185	72	55	5	11	4					704	1
	$\sum x^2$	630	1190	893	336	237	49	77	66					3478	1
	Mean in pounds	74·80	71·95	70·82	69·17	69·30	65·38	67·25	63·92						
	Overall mean for weight: 70·88 pounds														
61	n	274	590	518	395	255	168	86	56	37	22	13	12	2426	13
	$\sum x$	488	932	688	500	310	200	105	44	56	20	−4	0	3339	20
	$\sum x^2$	2162	3832	2784	1900	1514	1130	463	184	214	138	22	36	14379	68
	Mean in pounds	71·16	70·15	68·89	68·58	68·33	68·20	68·35	66·18	69·82	66·80	60·71			
	Overall mean for weight: 69·13 pounds														
62	n	68	165	186	170	139	76	58	49	19	20	13*		963	3
	$\sum x$	142	256	206	221	140	69	43	43	9	3	14		1146	−2
	$\sum x^2$	628	1118	848	989	620	311	255	181	55	75	42		5122	4
	Mean in pounds	72·69	70·01	67·79	68·75	67·29	66·78	65·96	66·64	64·62	63·00	67·64			
	Overall mean for weight: 68·20 pounds														

* Includes larger sizes of family

TABLE 23—*continued*

Weight by Size of Family for Father's Occupation

Father's Occupation		*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*
6x	n	23	39	59	44	23	31	15	18*					252	6
	$\sum x$	39	64	95	66	33	20	4	15					336	1
	$\sum x^2$	161	200	345	294	211	108	20	63					1402	17
	Mean in pounds	70·73	70·46	70·30	69·75	69·42	65·48	63·58	66·42						
	Overall mean for weight: 68·92 pounds														
63	n	79	145	201	241	143	125	100	77	30	21	19*		1181	9
	$\sum x$	119	168	235	263	116	77	103	58	6	23	28		1196	1
	$\sum x^2$	493	714	1101	1281	506	395	467	308	48	173	104		5590	11
	Mean in pounds	69·78	68·04	68·10	67·71	66·31	65·33	67·40	66·02	63·25	67·73	69·62			
	Overall mean for weight: 67·31 pounds														
70	n	11	29	29	22	17	27*							138	1
	$\sum x$	34	60	81	35	38	59							401	4
	$\sum x^2$	262	212	399	165	150	285							1463	16
	Mean in pounds	54·93	55·08	54·96	53·33	55·10	53·96								
	Overall mean for weight: 54·56 pounds														
80	n	44	66	84	74	56	32	21	14	22	14*			427	5
	$\sum x$	95	132	219	137	138	59	35	33	39	32			919	6
	$\sum x^2$	385	652	1245	581	628	279	123	101	227	118			4339	14
	Mean in pounds	73·05	72·25	75·29	71·51	74·57	71·47	70·58	74·04	71·11	73·68				
	Overall mean for weight: 73·01 pounds														

Weight by Size of Family for Occupational Classes 1, 4 and 6

(Mean Weight in Pounds)

Occupational Class	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	*Overall Mean*
1	75·74	74·98	72·93	74·36	74·60*							74·42
4	73·96	72·08	70·77	69·39	69·39*							70·97
6	72·20	70·09	68·39	68·96	67·59	66·41	65·47	67·16	64·63	63·02	66·94*	68·30

* Includes larger sizes of family

TABLE 24

Weight by Size of Family for Occupancy Rate

Boys and Girls

Occupancy Rate 1

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
120 +	1	1	2										4		4
115–9			1										1		1
110–4	2	3											5		5
105–9	1	3	2	1									7		7
100–4	2	2	2										6		6
95–9	2	1	5										8		8
90–4	10	12	3	1	1								27		27
85–9	13	11	9	1	3								37		37
80–4	24	23	6	4	1								58		58
75–9	30	30	15	7	1	3							86		86
70–4	33	52	16	6	7	5	1						120	1	121
65–9	32	34	23	8	3	2			1				103	1	104
60–4	18	22	15	7	3	2			1				68		68
55–9	10	15	5	1	1		1						33	1	34
50–4	5	3	1										9		9
49 –	1		1	1									3		3
Total	184	212	106	37	20	12	2		2				575	3	578
Unknown	2	2	3	2			1						10		10
Grand Total	186	214	109	39	20	12	3		2				585	3	588

Occupancy Rate 2

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
120 +	1	2			1	2	1		1				8	1	9
115–9	1	2	1	2									6		6
110–4	2	1	2	1	1								7		7
105–9	3	3	4	2	1								13		13
100–4	3	5	6	2									16		16
95–9	6	11	6	3	3	1			1				31		31
90–4	17	16	18	5	4		5		1	1		1	68	1	69
85–9	27	20	31	9	7	5	1	1	1				102	1	103
80–4	37	62	52	31	21	6	6	5	3	2			225		225
75–9	61	113	107	53	32	11	7	5	1				390	2	392
70–4	100	130	136	76	47	23	17	9	5	1		2	546	1	547
65–9	87	151	136	90	53	15	16	11	6		1	1	567	4	571
60–4	79	119	129	68	40	19	14	7	5	4	2		486		486
55–9	46	61	69	39	26	14	9	5	1	3	1		274	2	276
50–4	8	20	32	12	9	3				1	1		86	4	90
49 –	2	3	6	4	2		1						18		18
Total	480	719	735	397	247	99	77	43	25	12	5	4	2843	16	2859
Unknown	8	7	5	4	2	3	5	1	1	1			37		37
Grand Total	488	726	740	401	249	102	82	44	26	13	5	4	2880	16	2896

TABLE 24—*continued*

Weight by Size of Family for Occupancy Rate

Boys and Girls

Occupancy Rate 3

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
120 +		2											2		2
115–9															
110–4		2	1	1	1								5		5
105–9			1										1		1
100–4		2	2	1	1	1							7		7
95–9		5	1	2	3	2				1			14		14
90–4		5	6	4	3	1	2	1	1	1		1	25		25
85–9	2	16	12	8	5	5	3	3					54		54
80–4	7	33	34	20	15	13	5	4	3	4		1	139		139
75–9	11	62	57	49	29	23	13	8	6	6	2		266	2	268
70–4	10	98	79	54	47	39	19	9	10	5	3	3	376	5	381
65–9	5	90	104	68	43	51	28	28	8	4	6	3	438	2	440
60–4	8	88	85	67	54	56	21	16	13	10	2	6	426	4	430
55–9	8	43	53	36	35	29	19	14	8	6	2	1	254	1	255
50–4	3	11	23	16	13	8	6	3	4	2	2		91	4	95
49 –	1	3	5	3	4	7	2	2	1				28		28
Total	55	460	463	329	253	235	118	88	54	39	17	15	2126	18	2144
Unknown		3	2	2	5	2	3	1	3	1			22		22
Grand Total	55	463	465	331	258	237	121	89	57	40	17	15	2148	18	2166

Occupancy Rate 4

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Un-known*	*Grand Total*
120 +						1							1		1
115–9															
110–4															
105–9	1	1			1								3		3
100–4				2			2	1					5		5
95–9		1	1	3	1	1							7		7
90–4	1	2		6	2		2						13		13
85–9	3	2	2	12	5	1	1	1			1		28		28
80–4	3	8	11	13	7	5	7	3	2	2	1	1	63		63
75–9	3	10	11	31	16	12	9	8	2	3	2	1	108	1	109
70–4	10	19	26	68	41	17	19	15	6	1	2	3	227		227
65–9	11	25	24	67	49	30	32	25	7	3	3	4	280	2	282
60–4	7	24	25	73	37	33	25	19	15	7	6	4	275	4	279
55–9	8	19	16	47	30	21	19	8	7	7	4	1	187	2	189
50–4	2	5	6	15	14	7	6	7	2	5	1	2	72		72
49 –		4	2	6	3	1	4	5		1		1	27		27
Total	49	120	124	343	206	129	126	92	41	29	20	17	1296	9	1305
Unknown		1	1	2	7		3		1	1			16		16
Grand Total	49	121	125	345	213	129	129	92	42	30	20	17	1312	9	1321

TABLE 24—*continued*

Weight by Size of Family for Occupancy Rate

(excluding cases where size of family is not known)

x = weight in units of five pounds with origin at 62·0 pounds

Occupancy Rate		*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12
1	n	184	212	106	37	20	12	4*					
	Σx	457	518	281	73	44	21	2					
	Σx^2	2193	2478	1613	311	168	49	6					
	Mean in pounds	74·67	74·47	75·50	72·11	73·25	71·00	64·75					
2	n	480	719	735	397	247	99	77	43	25	12	9*	
	Σx	923	1284	1206	612	388	154	130	64	60	11	9	
	Σx^2	4205	5656	5472	2674	1736	790	610	202	333	79	51	
	Mean in pounds	71·86	71·18	70·45	69·96	70·10	70·03	70·69	69·69	74·25	66·83	67·25	
3	n	55	460	463	329	253	235	118	88	54	39	17	15*
	Σx	79	735	593	422	293	237	115	81	45	51	12	18
	Σx^2	335	3123	2541	1778	1399	1069	509	355	219	241	46	68
	Mean in pounds	69·43	70·24	68·65	68·66	68·04	67·29	67·12	66·85	66·42	68·79	65·78	68·25
4	n	49	120	124	343	206	129	126	92	41	29	20	17*
	Σx	70	122	136	386	193	106	115	67	22	2	17	9
	Σx^2	334	646	560	1778	909	562	605	375	96	102	78	59
	Mean in pounds	69·39	67·33	67·73	67·88	66·93	66·36	66·81	65·89	64·93	62·59	66·50	64·90

Occupancy Rate 1:
Overall mean for weight: 74·39 pounds
Overall variance for weight: 149·35 (pounds)^2

Occupancy Rate 2:
Overall mean for weight: 70·76 pounds
Overall variance for weight: 119·37 (pounds)^3

Occupancy Rate 3:
Overall mean for weight: 68·56 pounds
Overall variance for weight: 97·63 (pounds)^2

Occupancy Rate 4:
Overall mean for weight: 67·05 pounds
Overall variance for weight: 94·68 (pounds)^2

* Includes larger sizes of family

TABLE 25

Weight by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1889 and Earlier

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Un-known*	*Grand Total*
120+															
115–9															
110–4															
105–9															
100–4															
95–9															
90–4															
85–9															
80–4									1				1		1
75–9	1												1		1
70–4				1	1								2		2
65–9			1	1	1	1	3						7	1	8
60–4		1		2	1								4		4
55–9			1										1		1
50–4															
49 –															
Total	1	1	2	4	3	1	3		1				16	1	17
Unknown										1			1		1
Grand Total	1	1	2	4	3	1	3		1	1			17	1	18

Date of Mother's Birth 1890–4

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Un-known*	*Grand Total*
120+							1						1		1
115–9															
110–4															
105–9	1												1		1
100–4					1								1		1
95–9			1			1			1	1			4		4
90–4		1	1	1			1						4		4
85–9			1		2								3		3
80–4			1	2			1	1	1	2			8		8
75–9		3		6	6	3	3	1	4		1		27		27
70–4	1	2	1	5	3	1		1	3		1		18		18
65–9	1	1	4	3	2	4	7		4		1	1	28	1	29
60–4	4	2	5	3	3	1	3	2	1		1	1	26		26
55–9	1		5	2	5		1	1			1		16		16
50–4		1	1			1	1						4		4
49 –								1					1		1
Total	8	10	20	22	22	11	18	7	14	3	5	2	142	1	143
Unknown									1				1		1
Grand Total	8	10	20	22	22	11	18	7	15	3	5	2	143	1	144

TABLE 25—*continued*

Weight by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1895-9

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
120+	1	1			1								3		3
115–9			2	1									3		3
110–4					2								2		2
105–9		2	1										3		3
100–4		2		2		1		1		1			7		7
95–9		1	2	1	1								5		5
90–4	5	5		3	2					1			16		16
85–9	4	2	4	3	2	6	1	3	1		1		27		27
80–4	5	10	6	8	9	2	1	1	3	1			46		46
75–9	10	14	13	13	17	5	7	3	1	1			84		84
70–4	10	12	15	12	19	12	10	7	5	1	1	3	107		107
65–9	6	13	24	19	19	12	5	14	4	3	3	3	125	1	126
60–4	7	17	14	15	11	9	9	5	5	8	2	4	106	1	107
55–9	5	8	6	8	10	9	10	8	2	3	1		70	1	71
50–4		3	1	1	3	1	2	3		2	1		17		17
49 –			3	1	1	1	1						7		7
Total	53	90	91	87	97	58	46	45	21	21	9	10	628	3	631
Unknown		1			1		1	1	2				6		6
Grand Total	53	91	91	87	98	58	47	46	23	21	9	10	634	3	637

Date of Mother's Birth 1900–4

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*	*Grand Total*
120+		1				1							2		2
115–9	1	2		1									4		4
110–4		4	1	1									6		6
105–9	2	1	2	2									7		7
100–4	1	3	4	1									9		9
95–9	2	1	2	1	2	1							9		9
90–4	6	14	7	4	2		3	1	1	1		1	40		40
85–9	7	12	14	9	4	2	2	2					52		52
80–4	10	19	20	14	7	8	5	5	3	2			93		93
75–9	21	37	40	32	16	9	6	7	1	4	2	1	176		176
70–4	27	59	43	42	31	22	18	6	3	3	2	2	258	2	260
65–9	25	59	54	54	30	22	19	20	8	1	4	2	298	1	299
60–4	23	42	46	38	18	27	16	11	14	6	3	1	245	1	246
55–9	15	23	20	19	19	19	14	4	3	8	2	2	148		148
50–4	5	4	10	11	5	3	2	2	5	1	2	1	51	2	53
49 –	2	3	3	2	2	1	5	2		1			21		21
Total	147	284	266	231	136	115	90	60	38	27	15	10	1419	6	1425
Unknown	1	2	3	1	4	1	4		1				17		17
Grand Total	148	286	269	232	140	116	94	60	39	27	15	10	1436	6	1442

TABLE 25—*continued*

Weight by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1905–9

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Un-known*	*Grand Total*
120+	1		1			1			1				4		4
115–9															
110–4		2											2		2
105–9	1	1	2	1	2								7		7
100–4	1	3	1	1									6		6
95–9	3	10	5	2	3	1							24		24
90–4	8	7	4	2	2		2		1				26		26
85–9	14	20	18	8	6	1	1						68	1	69
80–4	24	38	31	18	14	7	3	3		2	1	2	143		143
75–9	29	69	52	33	16	15	3	5	1	1			224	1	225
70–4	43	90	77	52	31	21	11	10	3	2	1	2	343	3	346
65–9	32	95	79	54	39	30	17	19	3	3	2	2	375	1	376
60–4	22	72	62	62	40	33	13	13	8	3	2	4	334	2	336
55–9	13	31	34	34	19	15	12	7	8	2	1		176	1	177
50–4	2	11	12	9	11	4	3	4		3	1	1	61		61
49–	1	3	3	4	1	4	1	1				1	19		19
Total	194	452	381	280	184	132	66	62	25	16	8	12	1812	9	1821
Unknown	3	3	2	5	4	1	5			1			24		24
Grand Total	197	455	383	285	188	133	71	62	25	17	8	12	1836	9	1845

Date of Mother's Birth 1910-14

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Un-known*	*Grand Total*
120+		2	1										3		3
115–9															
110–4	4		2										6		6
105–9	1	1	1										3		3
100–4	2	1	2				1						6		6
95–9	3	5	2	2	1	1							14		14
90–4	5	4	9	4	1	1	1						25		25
85–9	17	11	15	9	6	2							60		60
80–4	24	44	33	14	13	4	4	1					137		137
75–9	29	66	58	41	17	11	8	3	2	1			236	4	240
70–4	44	105	83	66	36	16	14	4	3	1			372	1	373
65–9	43	88	93	77	38	21	22	7	2				391		391
60–4	29	87	93	67	40	30	15	6	4	2	2		375	3	378
55–9	24	51	52	39	29	16	10	4	1	1	2		229	3	232
50–4	7	14	25	14	13	6	2	1	1	2			85	2	87
49–	1	3	4	4	3	1		3	1				20		20
Total	233	482	473	337	197	109	77	29	14	7	4		1962	13	1975
Unknown	2	4	4	1	3	1	1	1	1				18		18
Grand Total	235	486	477	338	200	110	78	30	15	7	4		1980	13	1993

TABLE 25—*continued*

Weight by Size of Family for Date of Mother's Birth

Boys and Girls

Date of Mother's Birth 1915-19

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Unknown*	*Grand Total*
120 +						1							1		1
115–9															
110–4															
105–9		1	2										3		3
100–4	1	1	1			1							4		4
95–9		1		2									3		3
90–4	1	2	4	1	1		1						10		10
85–9	3	2	1	1			1						8		8
80–4	4	10	8	5	1	2	3						33		33
75–9	10	21	23	12	3	5	2			1	1		78		78
70–4	18	25	24	22	17	6	2	2	1				117		117
65–9	18	43	29	19	18	4	1	1					133	2	135
60–4	21	31	27	23	17	7	3	4	1				134	3	137
55–9	12	21	21	18	8	6	1		2				89	1	90
50–4	2	5	10	7	3	2	1						30		30
49 –		1	1	2	1								5		5
Total	90	164	151	112	69	34	15	7	4	1	1		648	6	654
Unknown	1	2	1	1	1		1						7		7
Grand Total	91	166	152	113	70	34	16	7	4	1	1		655	6	661

Date of Mother's Birth 1920 and Later

Weight in pounds	*Size of Family* 1	2	3	4	5	6	7	8	9	10	11	12 +	*Total*	*Unknown*	*Grand Total*
120 +															
115–9															
110–4															
105–9															
100–4															
95–9															
90–4	1				1								2		2
85–9															
80–4		1											1		1
75–9	2									1			3		3
70–4	1	1	1	1									4		4
65–9															
60–4	1	1	2										4	1	5
55–9	1	1			1	1							4		4
50–4															
49 –				1		1							2		2
Total	6	4	3	2	2	2				1			20	1	21
Unknown															
Grand Total	6	4	3	2	2	2				1			20	1	21

Note. There are also 275 cases in which the date of mother's birth is not known

TABLE 25—*continued*

Weight by Size of Family for Date of Mother's Birth

x = weight in units of five pounds with origin at 62·0 pounds
(Overall mean includes size of family unknown)

Date of Mother's Birth		1	2	3	4	5	6	7	8	9	10	11	12+	*Total*	*Unknown*
-1889	n	1	1	2	4	3	1	3		1				16	1
	$\sum x$	3	0	0	3	3	1	3		4				17	1
	$\sum x^2$	9	0	2	5	5	1	3		16				41	1
	Overall mean for weight: 67·54 pounds														
1890–4	n	8	10	20	22	22	11	18	7	14	3	5	2	142	1
	$\sum x$	11	18	21	43	39	20	35	5	33	15	5	1	246	1
	$\sum x^2$	87	76	143	147	187	88	235	39	117	81	15	1	1216	1
	Overall mean for weight: 70·89 pounds														
1895–9	n	53	90	91	87	97	57	47	45	21	21	19		628	3
	$\sum x$	133	198	165	168	186	83	38	50	32	19	16		1088	0
	$\sum x^2$	645	1080	855	814	938	373	176	244	108	143	52		5428	2
	Overall mean for weight: 70·87 pounds														
1900–4	n	147	284	266	231	136	115	90	60	38	27	15	10	1419	6
	$\sum x$	273	582	477	366	179	126	88	75	22	20	8	11	2227	1
	$\sum x^2$	1371	2910	2211	1680	737	602	450	303	136	138	40	61	10639	17
	Mean in pounds	71·54	72·50	71·22	70·17	68·83	67·73	67·13	68·48	65·14	65·95	64·92	67·75		
	Overall mean for weight: 70·07 pounds														
1905–9	n	194	452	381	280	184	132	66	62	25	16	8	12	1812	9
	$\sum x$	449	837	633	348	242	134	56	48	22	10	5	9	2793	14
	$\sum x^2$	1953	3501	2669	1468	1134	646	266	184	212	66	27	55	12181	48
	Mean in pounds	73·82	71·51	70·56	68·46	68·83	67·33	66·49	66·11	66·65	65·38	65·38	66·00		
	Overall mean for weight: 69·96 pounds														
1910–14	n	233	482	473	337	197	109	77	29	14	7	4		1962	13
	$\sum x$	474	739	651	392	192	94	90	13	8	0	−2		2651	7
	$\sum x^2$	2286	3037	3013	1532	886	432	332	101	46	22	2		11689	51
	Mean in pounds	72·42	69·92	69·13	68·07	67·12	66·56	68·09	64·49	65·11	62·25	59·75			
	Overall mean for weight: 68·98 pounds														
1915–19	n	90	164	151	112	69	34	15	13					648	6
	$\sum x$	113	208	189	106	54	49	31	11					761	1
	$\sum x^2$	439	858	925	518	194	327	141	33					3435	2
	Mean in pounds	68·53	68·59	68·51	66·98	66·16	69·46	72·58	66·48						
	Overall mean for weight: 68·08 pounds														
1920+	n	6	4	3	2	2	2				1			20	1
	$\sum x$	13	5	2	−1	5	−4				3			23	0
	$\sum x^2$	59	21	4	13	37	10				9			153	0
1899 *and earlier*	Mean in pounds	74·10	72·94	70·48	71·72	71·59	69·79	67·84	67·54	71·83	69·33	66·48			
	Overall mean for weight: 70·80 pounds														
1915 *and later*	Mean in pounds	68·81	68·59	68·45	66·86	65·70	68·50	72·58	60·82	57·25	69·75	72·25			
	Overall mean for weight: 68·06 pounds														

DISTRIBUTION OF TEST SCORE, HEIGHT AND WEIGHT

TABLE 26

Test Score by Height

(a) Boys

Height in Inches

Test Score	70+	69–8	67–6	65–4	63–2	61–0	59–8	57–6	55–4	53–2	51–0	49–8	47–6	45–4	43–2	41–0	*Total*	*Un-known*	*Grand Total*
70–6							2	3	5	2							12		12
65–9					1	4	6	20	10	10	1						52		52
60–4	2			1		8	20	37	38	27	3		1				137	1	138
55–9				1	2	6	20	65	73	46	9	3					225	1	226
50–4						8	26	71	91	65	25	4	2	1			293	1	294
45–9	1			1	1	8	36	68	110	93	45	5	2	2			372	5	377
40–4					1	12	27	75	98	94	45	7			2		361	4	365
35–9						3	14	69	106	114	47	14	1				368	1	369
30–4					2	1	15	46	84	98	33	10	4	1			294	1	295
25–9						1	15	42	75	79	47	10	1	1			271	1	272
20–4			1		2	3	9	33	64	56	27	8	5	1	2	1	212	2	214
15–9							12	21	55	47	42	9	1	1			188	3	191
10–4					1		3	17	39	51	21	14	4				150	1	151
5–9						2	3	14	27	39	30	7	3				125	2	127
0–4		1			2		2	13	22	29	33	10	1	1	1		115	2	117
YY							2	1	4	8	3	3	1	1			23		23
Total	3	1	1	3	12	56	212	595	901	858	411	104	26	9	5	1	3198	25	3223
XX						2	16	35	66	69	23	16	3				230	10	240
Grand Total	3	1	1	3	12	58	228	630	967	927	434	120	29	9	5	1	3428	35	3463

(b) Girls

Height in Inches

Test Score	70+	69–8	67–6	65–4	63–2	61–0	59–8	57–6	55–4	53–2	51–0	49–8	47–6	45–4	43–2	41–0	*Total*	*Un-known*	*Grand Total*
70–6					1	1	1	2	4	5							14		14
65–9					2	2	5	9	15	7	2				1		43		43
60–4					5	4	17	36	45	27	8	3					145		145
55–9	1				2	8	28	52	73	56	19	4	1				244	2	246
50–4				1	1	18	30	62	87	86	32	4	1	2			324	5	329
45–9					2	9	44	77	132	97	36	13	2				412	3	415
40–4					1	6	17	66	119	139	52	16		1			417	1	418
35–9	1	1				8	23	59	121	109	57	16	4		1		400		400
30–4			1	2	4	2	13	54	76	97	40	15	4	2			310	4	314
25–9						3	12	30	86	83	55	23	3	1	1	1	298	3	301
20–4			1		1	1	8	14	43	66	48	16	2	4			204		204
15–9						1	5	14	29	47	34	14	3				147	2	149
10–4			1			1	3	15	27	49	27	13	2	2			140		140
5–9						1	2	5	14	23	29	11	2		1	1	89	1	90
0–4	1						2	2	20	22	22	13	3				85	1	86
YY							1	1	7	5	3	3					20	1	21
Total	3	1	3	3	19	65	211	498	898	918	464	164	27	12	4	2	3292	23	3315
XX					1	7	16	41	55	70	48	8	4		1		251	7	258
Grand Total	3	1	3	3	20	72	227	539	953	988	512	172	31	12	5	2	3543	30	3573

x

TABLE 26—*continued*

Test Score by Height

x = test score in units of five points with origin at 37 points
v = height in units of two inches with origin at 48·5 inches
b_{vx} = regression of height on test score
r_{vx} = correlation of test score and height

Boys (n = 3,198)

$\Sigma x = -725$	$\Sigma x^2 = 35277$	$\Sigma' x^2 = 35112{\cdot}639$
$\Sigma v = 8703$	$\Sigma v^2 = 30235$	$\Sigma' v^2 = 6550{\cdot}758$
	$\Sigma xv = 2059$	$\Sigma' xv = 4032{\cdot}007$
$b_{vx} = +0{\cdot}616$		$r_{vx} = +0{\cdot}264$

Girls (n = 3,292)

$\Sigma x = +195$	$\Sigma x^2 = 32283$	$\Sigma' x^2 = 32271{\cdot}449$
$\Sigma v = 8587$	$\Sigma v^2 = 29773$	$\Sigma' v^2 = 7374{\cdot}285$
	$\Sigma xv = 4915$	$\Sigma' xv = 4406{\cdot}353$
$b_{vx} = +0{\cdot}598$		$r_{vx} = +0{\cdot}286$

TABLE 27

Test Score by Weight

(a) Boys

Weight in Pounds

Test Score	120+	119–15	114–10	109–5	104–0	99–5	94–0	89–5	84–0	79–5	74–0	69–5	64–0	59–5	54–0	49–5	44–0	39–	*Unknown*	*Grand Total*
70–6					1		1		2	2	1	4	1							12
65–9	1				1		2	4	2	12	16	6	6	2						52
60–4		1	1	1	1	3	5	9	18	27	26	26	13	2	3	1			1	138
55–9	1		2	1	1	1	4	9	17	45	55	47	28	11	2				2	226
50–4	1		1		2	4	7	9	30	49	56	65	47	17	4	1			1	294
45–9	1		2	1	2	7	8	18	36	44	78	72	54	37	10	2	1		4	377
40–4			1		3	2	6	13	31	55	68	79	61	34	5	1			6	365
35–9				1	1	1	5	4	27	58	87	84	54	32	11	2	1		1	369
30–4					2	2	2	8	26	35	69	71	52	19	9					295
25–9	1			1		2	3	3	20	35	44	68	56	32	3	1			3	272
20–4				1	1	1	3	7	15	27	41	41	42	20	11	1			3	214
15–9	1			1		2	1	4	12	22	44	31	35	28	9				1	191
10–4	1						1	2	8	14	33	30	32	22	6		1		1	151
5–9					1	1	3		9	9	24	27	31	14	3	3			2	127
0–4						1		2	5	14	17	30	18	19	7	1	1		2	117
YY			1			1			1	1	6	4	3	4	2					23
Total	7	1	8	7	16	28	51	92	259	449	665	685	533	293	85	13	4		27	3223
XX				1		2	5	13	12	24	50	51	38	21	9	4			10	240
Grand Total	7	1	8	8	16	30	56	105	271	473	715	736	571	314	94	17	4		37	3463

(b) Girls

Weight in Pounds

Test Score	120+	119–15	114–10	109–5	104–0	99–5	94–0	89–5	84–0	79–5	74–0	69–5	64–0	59–5	54–0	49–5	44–0	39–	*Unknown*	*Grand Total*
70–6			1				1	1			2	1	6	2						14
65–9			1	1	2		1	4	6	5	7	8	7	1						43
60–4				2	3	1	2	11	9	24	31	30	16	15		1				145
55–9	2	1	3		4	5	9	14	24	25	38	48	39	19	8	1		1	5	246
50–4		1	2	4	1	4	10	13	31	47	52	74	49	29	8	1			3	329
45–9			1	2	2	6	15	16	38	56	75	76	75	36	10	1			6	415
40–4			1		2	5	12	10	21	57	70	84	83	50	17	3			3	418
35–9	2	2		4	1	3	7	11	22	38	77	77	80	54	16	3	1		2	400
30–4	2			1	1	2	5	7	24	30	45	66	59	41	15	5	2		9	314
25–9				2	2	2	4	7	18	27	45	53	68	39	25	2	2		5	301
20–4				1			3	4	5	19	20	39	54	34	13	9	1		2	204
15–9						2	1		4	14	22	24	40	18	15	4	1		4	149
10–4					1		1	3	5	11	19	25	36	23	10	2	2		2	140
5–9	1					1	1		3	6	7	11	24	24	8	2	1		1	90
0–4			1					1	2	8	8	13	17	21	10	4			1	86
YY									2	1	3	2	4	6					3	21
Total	7	4	10	17	19	31	72	102	214	368	521	631	657	412	155	38	10	1	46	3315
XX	2				1	1	7	12	14	20	48	38	49	37	14	6			9	258
Grand Total	9	4	10	17	20	32	79	114	228	388	569	669	706	449	169	44	10	1	55	3573

TABLE 27—*continued*

Test Score by Weight

x = test score in units of five points with origin at 37 points
w = weight in units of five pounds with origin at 62·2 pounds
b_{wx} = regression of weight on test score
r_{wx} = correlation of test score and weight

Boys (n = 3,196)

$\Sigma x = -729$	$\Sigma x^2 = 35279$	$\Sigma' x^2 = 35143{\cdot}29$
$\Sigma w = 5208$	$\Sigma w^2 = 21372$	$\Sigma' w^2 = 12885{\cdot}37$
	$\Sigma wx = 2683$	$\Sigma' wx = 3870{\cdot}93$
$b_{wx} = +0{\cdot}300$		$r_{wx} = +0{\cdot}181$

Girls (n = 3,269)

$\Sigma x = 228$	$\Sigma x^2 = 32028$	$\Sigma' x^2 = 32012{\cdot}10$
$\Sigma w = 4444$	$\Sigma w^2 = 22756$	$\Sigma' w^2 = 16714{\cdot}87$
	$\Sigma wx = 5836$	$\Sigma' wx = 5526{\cdot}05$
$b_{wx} = +0{\cdot}331$		$r_{wx} = +0{\cdot}240$

TABLE 28

Height by Weight

(a) Boys

Height in inches	*Weight in Pounds* 120 +	119–15	114–10	109–5	104–0	99–5	94–0	89–5	84–0	79–5
70 +										
68–9										
66–7										
64–5	1		1		1					
62–3	1		2			2		3		1
60–1	4		2	2	7	5	11	5	11	5
58–9		1	3	3	6	8	24	41	68	45
56–7				2	2	11	17	39	115	198
54–5	1			1		3	4	13	62	178
52–3								3	12	39
50–1						1			2	5
48–9										1
46–7										
44–5										
42–3										1
41 –										
Total	7	1	8	8	16	30	56	104	270	473

Height in inches	*Weight in Pounds—continued* 74–0	69–5	64–0	59–5	54–0	49–5	44–0	39 –	*Total*
70 +			1		2				3
68–9				1					1
66–7			1						1
64–5									3
62–3	2	1							12
60–1	1	3							56
58–9	19	8	1	1					228
56–7	169	52	21						626
54–5	327	274	85	14	2	1			965
42–3	167	321	284	88	9	2			925
50–1	20	65	152	151	33	3	1		433
48–9	4	3	19	54	33	5	1		120
46 -7	1	2	3	3	12	6	2		29
44–5	2	5	1		1				9
42–3	1		1	1	1				5
41 –		1							1
Total	713	735	569	313	93	17	4		3417

TABLE 28

Height by Weight

(b) Girls

Height in inches	Weight in Pounds: 120 +	119–15	114–10	109–5	104–0	99–5	94–0	89–5	84–0	79–5
70 +		1								
68–9	1									
66–7								1		
64–5						1				1
62–3			4		6	2	1	2	1	1
60–1	2		1	4	3	11	15	7	17	6
58–9	4	1	1	5	6	5	23	36	59	45
56–7		2		8	5	7	21	50	74	144
54–5	2		2			5	17	14	60	139
52–3			1			1	2	3	13	46
50–1			1						3	4
48–9								1		1
46–7										
44–5										1
42–3									1	
41 –										
Total	9	4	10	17	20	32	79	114	228	388

Height in inches	Weight in Pounds—continued: 74–0	69–5	64–0	59–5	54–0	49–5	44–0	39 –	Total
70 +				1	1				3
68–9									1
66–7	1				1				3
64–5					1				3
62–3			1	1					19
60–1	1	1	1	1				1	71
58–9	25	10	3	1	1	1			226
56–7	137	53	28	8	1				538
54–5	232	281	158	35		1			946
52–3	154	253	338	146	16	3			976
50–1	17	62	151	187	78	5			508
48–9		5	21	63	59	20	2		172
46–7			1	4	10	11	3		29
44–5	2	1	1	1	1	2	3		12
42–3		1	2			1			5
41 –							2		2
Total	569	667	705	448	169	44	10	1	3514

x = weight in units of five pounds with origin at 62·0 pounds
y = height in units of two inches with origin at 48·5 inches

	n	Σx	Σy	Σx^2	Σy^2	Σxy
Boys	3417	+5562	+9252	22908	32000	+21857
Girls	3514	+4751	+9157	24487	31723	+20529
Total	6931	+10313	+18409	47395	63723	+42386

TABLE 29

TEST SCORE OF HIGH AND LOW SCORERS FROM WHOLE SURVEY BY SIZE OF FAMILY

(*a*) High Scorers

	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12	13+	*Total*
Number of Pupils	2790	5356	3725	1998	1023	557	317	170	99	47	26	13	5	16126
Total Test Score	159870	305697	210550	112166	56824	30894	16998	9355	5503	2589	1422	716	270	912854
Mean Test Score	57·30	57·08	56·52	56·14	55·55	55·46	53·62	55·03	55·59	55·09	54·69	55·08	54·00	56·61
High Scorers as Percentage of Whole Survey	35·54	33·58	25·53	18·26	13·33	11·02	9·49	8·07	7·73	6·70	7·37	6·53	3·18	22·97
Whole Survey	7851	15952	14588	10942	7672	5055	3342	2106	1281	702	353	199	157	70200

(*b*) Low Scorers

	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12	13+	*Total*
Number of Pupils	773	1509	1987	1890	1651	1267	914	611	410	230	113	79	65	11463
Total Test Score	7986	15868	21014	20040	16857	12689	9078	5777	4085	2185	941	803	570	117615
Mean Test Score	10·33	10·52	10·58	10·60	10·21	10·01	9·93	9·45	9·96	9·50	8·33	10·16	8·51	10·26
Low Scorers as Percentage of Whole Survey		9·46	13·62	17·27	21·52	25·06	27·35	29·01	32·01	32·76	32·01	39·70	41·40	16·33
Whole Survey	51	15952	14588	10942	7672	5055	3342	2106	1281	702	353	199	157	70200

TABLE 30

Test Score of High and Low Scorers by Father's Occupation

(a) High Scorers

Test Score	10	20	30	41, 42	51	52	61	62	63	6x	70	80	*Total*	10, 20	51, 52	62, 6x
							Father's Occupation									
70–6	8	2	4	1	1	3	5		1				25	10	4	
65–9	15	4	10	13	7	7	27	3	6	1	2	4	99	19	14	4
60–4	28	9	19	30	18	27	101	23	17	4	6	10	292	37	45	27
55–9	28	16	37	36	22	49	170	43	47	9	11	20	488	44	71	52
50–4	23	8	55	39	19	49	246	79	63	22	11	28	642	31	68	101
Total	102	39	125	119	67	135	549	148	134	36	30	62	1546	141	202	184
Sum of Test Scores	6109	2298	7105	6922	3899	7700	30913	8301	7483	1972	1705	3484	87891	8407	11599	10273
Mean Test Score	59·9	58·9	56·8	58·2	58·2	57·0	56·3	56·1	55·8	54·8	56·8	56·2	56·85	59·6	57·4	55·8
High Scorers as Percentage of 1546	6·6	2·5	8·1	7·7	4·3	8·7	35·5	9·6	8·7	2·3	1·9	4·0	99·9	9·1	13·1	11·9
Thirty-six-day Sample	143	78	335	236	145	413	2404	941	1141	258	143	433	6670	221	558	1199
High Scorers as Percentage of Thirty-six-day Sample	71·3	50·0	37·3	50·4	46·2	32·6	22·8	15·7	11·7	14·0	21·0	14·3	23·2	61·4	36·2	15·4

(b) Low Scorers

Test Score	10	20	30	41, 42	51	52	61	62	63	6x	70	80	*Total*	10, 20	51, 52	62, 6x
							Father's Occupation									
15–19		1	13	3		8	119	65	81	13	13	25	341	1	8	78
10–14		1	6	2	2	4	98	54	86	13	5	23	294	1	6	67
5–9			6	1	2	5	79	36	62	9	6	17	223		7	45
0–4			4	3		5	72	52	67	10	2	31	246		5	62
Total		2	29	9	4	22	368	207	296	45	26	96	1104	2	26	252
Sum of Test Scores		29	343	88	38	229	3896	2109	2977	460	327	882	11378	29	267	2569
Mean Test Score		14·5	11·8	9·8	9·5	10·4	10·6	10·2	10·1	10·2	12·6	9·2	10·3	14·5	10·3	10·2
Low Scorers as Percentage of 1104		0·2	2·6	0·8	0·4	2·0	33·3	18·8	26·8	4·1	2·4	8·7	100·1	0·2	2·4	22·8
Thirty-six-day Sample	143	78	335	236	145	413	2404	941	1141	258	143	433	6670	221	558	1199
Low Scorers as Percentage of Thirty-six-day Sample	0·0	2·6	8·7	3·8	2·8	5·3	15·3	22·0	25·9	17·4	18·2	22·2	16·6	0·9	4·7	21·0

TABLE 31

TEST SCORE OF HIGH AND LOW SCORERS BY OCCUPANCY RATE

	(a) High Scorers *Occupancy Rate*						(b) Low Scorers *Occupancy Rate*				
Test Score	1	2	3	4	*Total*	*Test Score*	1	2	3	4	*Total*
70–6	11	12	3		26	15–19	13	112	129	93	347
65–9	33	55	7	4	99	10–14	7	84	100	112	303
60–4	77	152	55	14	298	5–9	9	61	80	74	224
55–9	89	247	112	52	500	0–4	2	87	89	71	249
50–4	84	335	158	76	653						
Total	294	801	335	146	1576	Total	31	344	398	350	1123
Sum of Test Scores	17218	45472	18695	8052	89437	Sum of Test Scores	372	3583	4131	3585	11671
Mean Test Score	58·6	56·8	55·8	55·2	56·75	Mean Test Score	12·0	10·4	10·4	10·2	10·4
High Scorers as Percentage of 1576	18·7	50·8	21·3	9·3	100·1	Low Scorers as Percentage of 1123	2·8	30·6	35·4	31·2	100·0
Thirty-six-day Sample	569	2844	2111	1259	6783	Thirty-six-day Sample	569	2844	2111	1259	6783
High Scorers as Percentage of Thirty-six-day Sample	51·7	28·2	15·9	11·6	23·2	Low Scorers as Percentage of Thirty-six-day Sample	5·5	12·1	18·9	27·8	16·6

TABLE 32

Test Score of High and Low Scorers by Date of Mother's Birth

(a) High Scorers

Test Score	*Date of Mother's Birth* –1889	1890–4	1895–9	1900–4	1905–9	1910–14	1915–19	1920 –	*Total*
70–6			5	9	7	5			26
65–9		2	10	35	27	19	3		96
60–4	1	2	27	76	100	68	12	1	287
55–9	2	12	38	107	163	125	37	1	485
50–4	4	13	59	130	188	193	51		638
Total	7	29	139	357	485	410	103	2	1532
Sum of Test Scores	384	1618	7938	20564	27580	23010	5706	119	86919
Mean Test Score	54·9	55·8	57·1	57·6	56·9	56·1	55·4	59·5	56·7
High Scorers as Percentage of 1532	0·5	1·9	9·1	23·3	31·7	26·8	6·7	0·1	100·1
Thirty-six-day Sample	18	150	659	1492	1930	2065	679	20	7013
High Scorers as Percentage of Thirty-six-day Sample	40·0	19·3	21·1	23·9	25·1	19·9	15·2	10·0	21·8

(b) Low Scorers

Test Score	*Date of Mother's Birth* –1889	1890–4	1895–9	1900–4	1905–9	1910–14	1915–19	1920 –	*Total*
15–19		8	31	62	87	101	36	3	328
10–14		8	34	67	73	63	38		283
5–9	1	3	25	38	63	62	20	2	214
0–4		4	32	50	47	80	24	3	240
Total	1	23	122	217	270	306	118	8	1065
Sum of Test Scores	7	261	1174	2224	2890	3067	1256	71	10950
Mean Test Score	7·0	11·4	9·6	10·3	10·7	10·0	10·6	8·9	10·3
Low Scorers as Percentage of 1065	0·1	2·2	11·5	20·4	25·4	28·7	11·1	0·8	100·2
Thirty-six-day Sample	18	150	659	1492	1930	2065	679	20	7013
Low Scorers as Percentage of Thirty-six-day Sample	5·6	15·3	18·5	14·5	17·2	14·8	17·4	40·0	15·2

TABLE 33

Distribution of Height

(*a*) High Scorers

Height in Inches

		70+	69–8	67–6	65–4	63–2	61–0	59–8	57–6	55–4	53–2	51–0	49–8	47–6	45–4	43–2	41–0	*Total*
Number of Pupils	Boys	2			2	3	26	74	196	217	150	38	7	3	1			719
	Girls	1			1	11	33	81	161	224	181	61	11	2	2	1		770
	Both	3			3	14	59	155	357	441	331	99	18	5	3	1		1489
Both as Percentage of 1489		0·2			0·2	0·9	4·0	10·4	24·0	29·6	22·2	6·6	1·2	0·3	0·2	0·1		99·9
Both as Percentage of Thirty-six-day Sample		42·8			50·0	43·8	45·7	34·1	30·5	23·0	17·3	10·5	6·5	8·3	14·3	10·0		21·4
Thirty-six-day Sample		7	2	4	6	32	129	455	1169	1920	1915	946	292	60	21	10	3	6971

(*b*) Low Scorers

Height in Inches

		70+	69–8	67–6	65–4	63–2	61–0	59–8	57–6	55–4	53–2	51–0	49–8	47–6	45–4	43–2	41–0	*Total*
Number of Pupils	Boys		1			3	2	22	66	147	174	129	43	10	3	1		601
	Girls	1		1			3	13	37	97	146	115	54	10	2	1	1	481
	Both	1	1	1		3	5	35	103	244	320	244	97	20	5	2	1	1082
Both as Percentage of 1082		0·1	0·1	0·1		0·3	0·5	3·2	9·5	22·6	29·6	22·6	9·0	1·8	0·5	0·2	0·1	100·2
Both as Percentage of Thirty-day-six Sample		14·3	50·0	25·0		9·4	3·9	7·7	8·8	12·7	16·7	25·8	32·2	33·3	23·8	20·0	33·3	15·5
Thirty-six-day Sample		7	2	4	6	32	129	455	1169	1920	1915	946	292	60	21	10	3	6971

TABLE 34

Distribution of Weight

(a) High Scorers

Weight in Pounds

	120+	119–15	114–10	109–5	104–00	99–5	94–0	89–5	84–0	79–5	74–0	69–5	64–0	59–5	54–0	49–5	44–0	39–	*Total*
Number of Cases: Boys	3	1	4	2	6	8	19	31	69	135	154	148	95	32	9	2			718
Number of Cases: Girls	2	2	7	7	10	10	23	43	70	101	130	161	117	66	16	3		1	769
Number of Cases: Both	5	3	11	9	16	18	42	74	139	236	284	309	212	98	25	5		1	1487
Both as Percentage of 1487	0·3	0·2	0·7	0·6	1·1	1·2	2·8	5·0	9·3	15·9	19·1	20·8	14·3	6·6	1·7	0·3		0·1	100·0
Both as Percentage of Thirty-six-day Sample	35·7	60·0	61·1	37·5	45·7	30·5	34·1	38·1	29·4	28·9	23·9	23·5	17·8	13·9	10·4	9·8		100·0	23·0
Thirty-six-day Sample	14	5	18	24	35	59	123	194	473	817	1186	1316	1190	705	240	51	14	1	6465

(b) Low Scorers

Weight in Pounds

	120+	119–15	114–10	109–5	104–00	99–5	94–0	89–5	84–0	79–5	74–0	69–5	64–0	59–5	54–0	49–5	44–0	39–	*Total*
Number of Cases: Boys	2		1	1	1	5	5	8	35	60	124	122	119	87	27	4	2		603
Number of Cases: Girls	1		1		1	3	3	4	16	40	59	75	121	92	43	12	4		475
Number of Cases: Both	3		2	1	2	8	8	12	51	100	183	197	240	179	70	16	6		1078
Both as Percentage of 1078	0·3		0·2	0·1	0·2	0·7	0·7	1·1	4·7	9·3	17·0	18·3	22·3	16·6	6·5	1·5	0·6		100·1
Both as Percentage of Thirty-six-day Sample	21·4		11·1	4·2	5·7	13·6	6·5	6·2	10·8	12·2	15·4	15·0	20·2	25·4	29·2	31·4	42·9		16·7
Thirty-six-day Sample	14	5	18	24	35	59	123	194	473	817	1186	1316	1190	705	240	51	14	1	6465

SOCIAL FACTORS

TABLE 35

Occupational Class by Size of Family for Date of Mother's Birth

Boys and Girls

Mothers Born 1889 and Earlier

Size of Family

Occupational Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
1																			
2																			
3																			
4	1																1		1
5			1	1	1		1		1								5	1	6
6				2	2	1		1									6		6
7			1	1			2										4		4
8										1							1		1
9		1															1		1
Total	1	1	2	4	3	1	3	1	1	1							18	1	19
Unknown																			
Grand Total	1	1	2	4	3	1	3	1	1	1							18	1	19

Mothers Born 1890–4

Size of Family

Occupational Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
1	1	1				1	1										4		4
2		1	2	3	1		1										8		8
3			1		1		1										3		3
4		2	1	4	1		3		2								13		13
5	3	3	6	7	6	4		2	3	1							35		35
6		1	3	5	5	2	4	4	1	1	3						29		29
7	3	1	3	2	5	4	7	2	4	1	1		2				35	1	36
8		1	1		1				1								4		4
9	1	1	4	2	2	2	2		4		1						19		19
Total	8	11	21	23	22	13	19	8	15	3	5		2				150	1	151
Unknown																			
Grand Total	8	11	21	23	22	13	19	8	15	3	5		2				150	1	151

Mothers Born 1895–9

Size of Family

Occupational Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
1	4	7	9	5				1									25		25
2	5	10	3	4	1	3	3	2									31		31
3	5	6	4	2	2	1	4										24		24
4	6	12	10	7	9	2	4										50		50
5	19	27	28	27	32	18	18	4	10	4	4	4					195	1	196
6	5	8	7	21	33	15	10	16	4	5	2		1				128	1	129
7	2	11	14	17	18	17	8	21	5	7	2	2		1			125		125
8	1	4	2	2	2			1		1		1	1				15		15
9	6	8	14	6	4	3	2		4	3	2						52	1	53
Total	53	93	91	91	101	59	49	45	23	20	10	7	2	1			645	3	648
Unknown	1	1	3		1	4		1		1							12		12
Grand Total	54	94	94	91	102	63	49	46	23	21	10	7	2	1			657	3	660

Mothers Born 1900–4

Size of Family

Occupational Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
1	10	26	18	8	3	4			1								69		69
2	15	26	20	16	5	3	4			2	1						92		92
3	19	28	13	5	2	1	2	2			1						73		73
4	16	30	43	6	13	5	2		3	1	2						121		121
5	47	106	81	74	45	50	25	19	11	10	2			1	2		473		473
6	17	37	49	47	29	19	22	15	9	8	2		1	2			257	3	260
7	11	16	32	58	28	25	34	18	11	5	5	2	1				246	3	249
8	1	10	7	6	4	1	2	1		1	2					1	36		36
9	11	17	13	14	11	10	7	9	4	1	1						99		99
Total	147	296	276	234	140	118	98	64	39	28	16	2	2	3	2	1	1466	6	1472
Unknown	6	7	3	5	4	1	1										27		27
Grand Total	153	303	279	239	144	119	99	64	39	28	16	2	2	3	2	1	1493	6	1499

TABLE 35—*continued*

Occupational Class by Size of Family for Date of Mother's Birth

Boys and Girls

Mothers Born 1905–9

Size of Family

Occupational Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
1	15	39	18	7	1	2											82	1	83
2	12	29	18	7	6	5	5	1	1		1						85	1	86
3	19	37	18	9	4												87		87
4	25	64	37	29	12		3	1	1								172	1	173
5	85	180	162	109	80	49	20	21	8	5	3	3	2				727	5	732
6	20	54	71	52	38	38	19	16	4	6	2	2	1		1		324		324
7	13	40	41	49	36	35	20	20	8	5	2			1			270		270
8	7	14	10	7	4	2	3	2									49		49
9	4	18	19	28	18	6	4	5	4	1					2		109	1	110
Total	200	475	394	297	199	137	74	66	26	17	8	5	3	1	3		1905	9	1914
Unknown	2	6	10	2	2		3										25		25
Grand Total	202	481	404	299	201	137	77	66	26	17	8	5	3	1	3		1930	9	1939

Mothers Born 1910–14

Size of Family

Occupational Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
1	7	15	10			1	1										34	1	35
2	22	24	26	14	4	4		1									95	2	97
3	14	28	9	5	1												57		57
4	29	54	52	16	9	2	2	3	2								169	1	170
5	95	220	200	146	77	39	22	10	3	1	4						817	5	822
6	33	76	91	60	48	26	21	5	3	5							368	4	372
7	23	52	76	78	42	32	25	10	6	1							345		345
8	3	5	3	5	5	2	1	1									25		25
9	10	21	28	19	18	10	6	2	3								117		117
Total	236	495	495	343	204	116	78	32	17	7	4						2027	13	2040
Unknown	9	11	7	7	4	2	2										42		42
Grand Total	245	506	502	350	208	118	80	32	17	7	4						2069	13	2082

Mothers Born 1915–19

Size of Family

Occupational Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
1	1	2	3														6		6
2	5	5	5	1	1												17		17
3	2	2	2	1													7		7
4	4	11	14	7	7	1			1								45		45
5	27	74	60	34	28	11	4	2	1								241	1	242
6	12	35	29	28	16	7	2	3	1	1	1						135	1	136
7	21	31	32	35	17	12	4	1									153	4	157
8			2	2	1	1											6		6
9	8	5	11	8	4	2	6	1	1								46		46
Total	80	165	158	116	74	34	16	7	4	1	1						656	6	662
Unknown	13	6	3		1												23		23
Grand Total	93	171	161	116	75	34	16	7	4	1	1						679	6	685

Mothers Born 1920 and Later

Size of Family

Occupational Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	*Total*	*Unknown*	*Grand Total*
1																			
2																			
3																			
4																			
5	1	2	1		1												5	1	6
6		1				1											2		2
7	4		1	1	1	1											8		8
8			1														1		1
9		1															1		1
Total	5	4	3	1	2	2											17	1	18
Unknown	1			1													2		2
Grand Total	6	4	3	2	2	2											19	1	20

TABLE 35—*continued*

Family Size by Occupational Class for Date of Mother's Birth

x = family size in units

Date of Mother's Birth		*Occupational Class* 1	2	3	4	5	6	7	8	9	*Total*
– 1889	n				1	5	6	4	1	1	18
	Σx				1	28	32	21	10	2	94
	Mean					5·6	5·3	5·3			5·2
1890–4	n	4	8	3	13	35	29	35	4	19	150
	Σx	16	32	15	67	162	180	219	19	106	816
	Mean	4·0	4·0	5·0	5·2	4·6	6·2	6·3	4·8	5·6	5·4
1895–9	n	25	31	24	50	195	128	125	15	52	645
	Σx	65	110	81	173	913	700	725	76	228	3071
	Mean	2·6	3·5	3·4	3·5	4·7	5·5	5·8	5·1	4·4	4·76
1900–4	n	69	92	73	121	473	257	246	36	99	1466
	Σx	196	293	191	397	1915	1183	1284	146	449	6054
	Mean	2·8	3·2	2·6	3·3	4·0	4·6	5·2	4·1	4·5	4·13
1905–9	n	82	85	87	172	727	324	270	49	109	1905
	Σx	192	275	203	478	2586	1398	1260	162	479	7015
	Mean	2·3	3·2	2·3	2·8	3·6	4·3	4·7	3·3	4·4	3·68
1910–14	n	34	95	57	169	817	368	345	25	117	2027
	Σx	80	256	122	470	2653	1358	1388	94	447	6868
	Mean	2·4	2·7	2·1	2·8	3·2	3·7	4·0	3·8	3·8	3·39
1915–19	n	6	17	7	45	241	135	153	6	46	656
	Σx	14	39	16	146	750	471	512	25	174	2147
	Mean	2·3	2·3	2·3	3·2	3·1	3·5	3·3	4·2	3·9	3·27
1920 +	n					5	2	8	1	1	17
	Σx					13	8	22	3	2	48
	Mean					2·6	4·0	2·8			2·8
1899 and Earlier	Mean	2·8	3·6	3·6	3·8	4·7	5·6	5·9	5·3	4·7	4·89
1915 and Later	Mean	2·3	2·3	2·3	3·2	3·1	3·5	3·3	4·0	3·7	3·26

TABLE 36

Percentage Distribution of Occupancy Rate by Size of Family for Occupational Class

Boys and Girls

Occupational Class	Size of Family	Occupancy Rate 1	2	3	4	Unknown	Total
1	1	81·8	13·6	2·3		2·3	100·0
	2	69·1	28·7	1·1		1·1	100·0
	3	54·1	39·3	4·9		1·6	99·9
	4	50·0	50·0				100·0
	5	33·3	33·3	33·3			99·9
	6+	33·3	50·0	8·3	8·3		99·9
	Unknown	50·0	50·0				100·0
	Overall	63·2	31·8	3·3	0·4	1·3	100·0

Occupational Class	Size of Family	Occupancy Rate 1	2	3	4	Unknown	Total
2	1	31·1	57·4	6·6	1·6	3·3	100·0
	2	34·3	45·5	18·2	1·0	1·0	100·0
	3	18·4	52·6	23·7	5·3		100·0
	4	8·2	53·1	24·5	14·3		100·1
	5	5·0	60·0	25·0	10·0		100·0
	6+	5·3	47·4	15·8	31·6		100·1
	Unknown	20·0	40·0	20·0	20·0		100·0
	Overall	21·6	51·1	18·4	8·0	0·9	100·0

Occupational Class	Size of Family	Occupancy Rate 1	2	3	4	Unknown	Total
3	1	50·0	48·3			1·7	100·0
	2	33·0	54·4	12·6			100·0
	3	26·5	65·3	8·2			100·0
	4	13·6	54·5	31·8			99·9
	5	10·0	50·0	40·0			100·0
	6+	8·3	33·3	50·0	8·3		99·9
	Unknown						
	Overall	32·0	53·9	13·3	0·4	0·4	100·0

Occupational Class	Size of Family	Occupancy Rate 1	2	3	4	Unknown	Total
4	1	36·1	54·2	6·0	3·6		99·9
	2	10·9	59·3	27·0	2·8		100·0
	3	5·6	67·1	23·6	3·1	0·6	100·0
	4		42·5	[illegible]	19·2	2·7	100·0
	5	5·8	48·1	[illegible]	21·2	1·9	100·1
	6+	2·3	22·7	[illegible]	20·5		100·0
	Unknown						
	Overall	11·1	54·4	25·9	7·9	0·7	100·0

Occupational Class	Size of Family	Occupancy Rate 1	2	3	4	Unknown	Total
5	1	14·8	73·1	6·2	5·9		100·0
	2	4·5	49·4	27·6	8·2	0·3	100·0
	3	2·7	49·9	39·8	7·2	0·4	100·0
	4	1·7	33·6	29·2	34·8	0·7	100·0
	5	1·1	31·9	39·9	26·7	0·4	100·0
	6+	0·2	18·7	41·7	39·3		99·9
	Unknown		23·1	38·5	30·8	7·7	100·1
	Overall	3·8	42·8	34·1	19·0	0·3	100·0

Occupational Class	Size of Family	Occupancy Rate 1	2	3	4	Unknown	Total
6	1	4·3	72·0	14·0	8·6	1·1	100·0
	2	0·5	46·0	40·5	12·1	0·9	100·0
	3	0·4	42·1	41·8	15·3	0·4	100·0
	4	0·4	30·7	27·6	40·9	0·4	100·0
	5	1·1	27·0	36·8	33·9	1·1	99·9
	6+	0·9	13·4	49·1	35·9	0·6	99·9
	Unknown		11·1	55·6	33·3		100·0
	Overall	0·9	33·6	38·3	26·4	0·7	99·9

TABLE 36—*continued*

Percentage Distribution of Occupancy Rate by Size of Family for Occupational Class

Boys and Girls

Occupational Class	*Size of Family*	*Occupancy Rate* 1	2	3	4	*Unknown*	*Total*
7	1	8·1	65·1	10·5	16·3		100·0
	2	2·6	38·3	39·0	19·5	0·6	100·0
	3	1·0	43·0	39·1	15·9	1·0	100·0
	4	1·2	30·4	34·4	33·6	0·4	100·0
	5		24·7	31·2	44·2		100·1
	6+	0·3	17·5	44·8	36·1	1·3	100·0
	Unknown	11·1	22·2	55·6	11·1		100·0
	Overall	1·4	31·1	37·1	29·6	0·7	100·0

Occupational Class	*Size of Family*	*Occupancy Rate* 1	2	3	4	*Unknown*	*Total*
8	1	63·6	36·4				100·0
	2	57·1	40·0	2·9			100·0
	3	37·9	55·2	6·9			100·0
	4	52·0	48·0				100·0
	5	23·5	76·5				100·0
	6+		64·3	32·1	3·6		100·0
	Unknown		100·0				100·0
	Overall	37·7	53·4	8·2	0·7		100·0

	Size of Family	*Occupancy Rate* 1	2	3	4	*Unknown*	*Total*
9	1	18·7	66·7	10·4	2·1	2·1	100·0
	2	10·7	57·3	24·0	8·0		100·0
	3	13·0	67·4	14·1	4·3	1·1	99·9
	4	1·3	49·4	34·2	13·9	1·3	100·1
	5	6·6	42·6	32·8	18·0		100·0
	6+	3·4	32·8	40·3	23·5		100·0
	Unknown		60·0	40·0			100·0
	Overall	7·9	50·9	27·8	12·7	0·6	99·9

	Size of Family	*Occupancy Rate* 1	2	3	4	*Unknown*	*Total*
Unknown	1	14·0	44·2	14·0	16·3	11·6	100·0
	2	11·9	33·3	19·0	9·5	26·2	99·9
	3	8·3	33·3	14·6	8·3	35·4	99·9
	4		57·1	28·6	9·5	4·8	100·0
	5		40·0	33·3	20·0	6·7	100·0
	6+		32·3	22·6	19·4	25·8	100·1
	Unknown		20·0			80·0	100·0
	Overall	7·3	38·0	19·0	12·7	22·9	99·9

All Occupational Classes	*Size of Family*	*Occupancy Rate* 1	2	3	4	*Unknown*	*Total*
	1	23·3	61·7	7·4	6·2	1·3	99·9
	2	13·7	47·4	30·2	7·6	1·1	100·0
	3	7·4	50·3	32·2	8·5	1·6	100·0
	4	3·6	36·2	29·4	30·0	0·8	100·0
	5	2·6	33·4	34·4	29·0	0·6	100·[illegible]
	6+	1·2	20·9	43·0	33·8	1·1	100·0
	Unknown	5·8	30·8	36·5	17·3	9·6	100·0
	Overall	8·3	41·2	30·9	18·5	1·2	100·1

TABLE 37

Occupational Class by Size of Family for Location of Home

Boys and Girls

Occupational Class	Location of Home	Size of Family 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	Unknown	Grand Total
1	1	14	34	33	11	1	2	2		1								98	1	99
	2	7	10	8	4	1												30		30
	3	1	9	1		1	1											13	1	14
	4	21	41	19	5	3	5		1									95		95
	Total	43	94	61	20	6	8	2	1	1								236	2	238
2	1	17	33	30	17	5	7	3		1	1							114	1	115
	2	15	11	8	8	2	3	2				1						50		50
	3	2	7	4	3		1	1										18		18
	4	27	48	34	21	13	4	7	5		1	1						161	3	164
	Total	61	99	76	49	20	15	13	5	1	2	2						343	4	347
3	1	31	48	22	7	4		2	2			1						117		117
	2	14	11	9	3		1	2										40		40
	3	1	5	3	1	1												11		11
	4	14	38	15	11	5	1	3										87		87
	Total	60	102	49	22	10	2	7	2			1						255		255
4	1	42	97	82	42	31	5	8	1	4		1						313	2	315
	2	16	37	19	15	6	3	3	1	2	1							103		103
	3	3	13	10	2	2	2											32		32
	4	22	31	50	15	13	3	3	2	3		1			1			144	1	145
	Total	83	178	161	74	52	13	14	4	9	1	2			1			592	3	595
5	1	137	276	222	180	115	60	36	25	14	7	5	2					1079	7	1086
	2	48	108	93	65	40	40	14	9	9	5	4	1	1				437	1	438
	3	15	40	48	32	23	9	6	4	1	2		1		1			182	3	185
	4	90	199	190	131	95	65	36	22	15	8	4	3	1		2		861	2	863
	Total	290	623	553	408	273	174	92	60	39	22	13	7	2	1	2		2559	13	2572
6	1	34	72	98	75	69	24	20	30	8	9	2	1					442	5	447
	2	14	33	49	45	27	24	19	9	2	9	2						233	1	234
	3	5	21	16	22	7	11	7	1		1	1	1	1				94		94
	4	40	89	98	82	70	53	35	21	12	8	5		2	1	1		517	2	519
	Total	93	215	261	224	173	112	81	61	22	27	10	2	3	1	1		1286	8	1294
7	1	23	73	108	133	86	64	45	32	14	11	4	2	2	1			598	6	604
	2	14	31	31	44	24	22	21	22	4	4	2						219		219
	3	3	5	9	12	7	9	7	3	2	1	1						59	1	60
	4	46	45	59	58	37	35	30	23	14	5	3	3	1	1			360	2	362
	Total	86	154	207	247	154	130	103	80	34	21	10	5	3	2			1236	9	1245
8	1	1		1		1												3		3
	2		2	1	1													4		4
	3			1														1		1
	4	10	33	26	23	16	7	7	6	1	3	2	1	1				136	1	137
	Total	11	35	29	24	17	7	7	6	1	3	2	1	1				144	1	145
9	1	2	1	7	2		3	1		1								17		17
	2	2	1		2	2	2											9		9
	3		1		1	1		1		1	1							6		6
	4	43	72	85	74	58	33	26	17	20	5	4		1		2	1	441	5	446
	Total	47	75	92	79	61	38	28	17	22	6	4		1		2	1	473	5	478

TABLE 37—*continued*

OCCUPATIONAL CLASS BY SIZE OF FAMILY FOR LOCATION OF HOME

Boys and Girls

x = family size in units

Mean Size of Family

Location of Home

Occupational Class		1	2	3	4	*Total*
1	n	98	30	13	95	236
	Σx	265	56	33	233	587
	Mean	2·7	1·9	2·5	2·5	2·5
2	n	114	50	18	161	343
	Σx	348	146	53	508	1055
	Mean	3·1	2·9	2·9	3·2	3·1
3	n	117	40	11	87	255
	Σx	282	95	29	231	637
	Mean	2·4	2·4	2·6	2·7	2·5
4	n	313	103	32	144	592
	Σx	946	282	89	466	1783
	Mean	3·0	2·7	2·8	3·2	3·0
5	n	1079	437	182	861	2559
	Σx	3737	1613	665	3213	9228
	Mean	3·5	3·7	3·7	3·7	3·6
6	n	442	233	94	517	1286
	Σx	1837	1021	382	2219	5459
	Mean	4·2	4·4	4·1	4·3	4·3
7	n	598	219	59	360	1236
	Σx	2754	1018	289	1606	5667
	Mean	4·6	4·6	4·9	4·5	4·6
8	n	3	4	1	136	144
	Σx	9	11	3	551	574
	Mean	3·0	2·8	3·0	4·1	4·0
9	n	17	9	6	441	473
	Σx	67	33	37	1877	2014
	Mean	3·9	3·7	6·2	4·3	4·3
ALL	n	2781	1125	416	2802	7214
	Σx	10245	4275	1580	10904	27004
	Mean	3·68	3·80	3·80	3·89	3·74

TABLE 38

Test Score by Location of Home for Location of Birthplace

Boys and Girls

Location of Home	Test Score	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
1	70–6	12				12		12
	65–9	29	2		2	33	1	34
	60–4	122	3		9	134	10	144
	55–9	184	5		15	204	6	210
	50–4	234	1	2	9	246	12	258
	45–9	312	6	2	6	326	10	336
	40–4	302	4	1	11	318	9	327
	35–9	308	4	1	6	319	7	326
	30–4	227	1	1	11	240	10	250
	25–9	190	4	2	3	199	3	202
	20–4	155	2		2	159	9	168
	15–9	122	1			123	5	128
	10–4	114	3		2	119	2	121
	5–9	74	1		2	77	3	80
	0–4	63		1	2	66	3	69
	YY	20			1	21	1	22
	Total	2468	37	10	81	2596	91	2687
	XX	189	2		8	199	9	208
	Grand Total	2657	39	10	89	2795	100	2895

Location of Home	Test Score	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
2	70–6		7		2	9		9
	65–9	1	9		2	12	3	15
	60–4	2	25		3	30	4	34
	55–9	3	68		11	82	5	87
	50–4	6	87	2	9	104	9	113
	45–9	7	94	1	9	111	12	123
	40–4	8	110	1	18	137	8	145
	35–9	5	97		9	111	3	114
	30–4	4	68		11	83	6	89
	25–9	3	82		12	97	4	101
	20–4	1	54		5	60	3	63
	15–9	3	39		8	50	4	54
	10–4	2	40		4	46	4	50
	5–9	1	33		1	35	3	38
	0–4		30		3	33	1	34
	YY		7			7		7
	Total	46	850	4	107	1007	69	1076
	XX	7	58	1	6	72	3	75
	Grand Total	53	908	5	113	1079	72	1151

	Test Score	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
3	70–6							
	65–9	1		7		8		8
	60–4	1	1	11	1	14	2	16
	55–9	1	2	18	7	28	2	30
	50–4	4	5	30	3	42	1	43
	45–9	3	1	28	6	38	7	45
	40–4	3	3	29	5	40	2	42
	35–9	6	1	42	3	52	4	56
	30–4		3	27	4	34	4	38
	25–9		2	26	4	32	3	35
	20–4		1	18	1	20	3	23
	15–9	1		15	2	17		17
	10–4	1		10	1	12	2	14
	5–9		2	6	4	12	1	13
	0–4		1	11		12	2	14
	YY							
	Total	21	22	278	41	362	33	395
	XX	1	2	23	5	31	1	32
	Grand Total	22	24	301	46	393	34	427

	Test Score	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
4	70–6	2			3	5		5
	65–9	6	2	1	27	36	7	43
	60–4	9	4	6	60	79	26	105
	55–9	11	7	1	138	157	19	176
	50–4	14	4	2	196	216	24	240
	45–9	17	12	10	258	297	37	334
	40–4	15	14	8	233	270	38	308
	35–9	26	15	3	236	280	24	304
	30–4	11	10	6	227	254	12	266
	25–9	22	11	2	200	235	17	252
	20–4	12	11	6	143	172	15	187
	15–9	11	1	6	125	143	9	152
	10–4	6	11		96	113	6	119
	5–9	7	2	7	73	89	7	96
	0–4	7	2	2	76	87	6	93
	YY	1		2	14	17	2	19
	Total	177	106	62	2105	2450	249	2699
	XX	16	14		166	196	12	208
	Grand Total	193	120	62	2271	2646	261	2907

TABLE 38—*continued*

TEST SCORE BY LOCATION OF HOME FOR LOCATION OF BIRTHPLACE

x = test score in units of five points with origin at 37

Location of Home		Location of Birthplace 1	2	3	4	Total	XX	Grand Total
1	n	2468	37	10	81	2596	91	2687
	Σx	+77	+26	−1	+101	+203	+26	+229
	Σx^2	25197	426	85	963	26671	1076	27747
	Mean	37·16	40·51	36·50	43·23	37·39	38·43	37·43
2	n	46	850	4	107	1007	69	1076
	Σx	+29	−148	+9	+19	−91	+33	−58
	Σx^2	383	9156	23	1071	10633	795	11428
	Mean	40·15	36·13	48·25	37·89	36·58	39·39	36·73
3	n	21	22	278	41	362	33	395
	Σx	+27	+4	−12	+7	+26	−12	+14
	Σx^2	169	250	2764	423	3606	348	3954
	Mean	43·43	37·91	36·78	37·85	37·36	35·18	37·18
4	n	177	106	62	2105	2450	249	2699
	Σx	−33	−40	−48	−732	−853	+207	−646
	Σx^2	2101	996	880	21608	25585	2761	28346
	Mean	36·07	35·11	33·13	35·26	35·26	14·16	35·80
ALL	n	2712	1015	354	2334	6415	442	6857
	Σx	+100	−158	−52	−605	−715	+254	−461
	Σx^2	27850	10828	3752	24065	66495	4980	71475
	Mean	37·18	36·22	36·27	35·70	36·44	39·87	36·66

	*Migrants (including unknown) Location of Home 1	2	3	4	Total	Migrants (excluding unknown) Location of Home 1	2	3	4	Total
n	219	226	117	594	1156	128	157	84	345	714
Σx	+152	+90	+26	+86	+354	+126	+57	+38	−121	+100
Σx^2	2550	2272	1190	6738	12750	1474	1477	842	3977	7770
Mean	40·47	38·99	38·11	37·72	38·53	41·92	38·82	39·26	35·25	37·70

*Non-migrants are those whose location of home and location of birthplace are the same; the results for them may be obtained directly from the tables above. The cases recorded as XX are those whose location of birthplace is not known.

TABLE 39

Height by Location of Home for Location of Birthplace

Boys and Girls

Location of Home	Height in inches	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
1	70+	3				3		3
	68–9							
	66–7	1				1		1
	64–5	1				1		1
	62–3	12			2	14	1	15
	60–1	30	1	1	1	33	5	38
	58–9	149	3		10	162	7	169
	56–7	393	6		22	421	16	437
	54–5	675	11	3	18	707	25	732
	52–3	741	11	3	22	777	25	802
	50–1	409	7	3	5	424	9	433
	48–9	136			2	138	2	140
	46–7	30			1	31		31
	44–5	6				6	1	7
	42–3	3				3		3
	40–1	1				1		1
	39–							
	Total	2590	39	10	83	2722	91	2813
	Unknown	18				18	8	26
	Grand Total	2608	39	10	83	2740	99	2839

Location of Home	Height in inches	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
2	70+							
	68–9							
	66–7							
	64–5		1			1		1
	62–3		2			2		2
	60–1		13		5	18		18
	58–9	2	56	1	7	66	3	69
	56–7	7	133		20	160	7	167
	54–5	20	226	4	26	276	6	282
	52–3	18	256		34	308	9	317
	50–1	1	133		9	143	1	144
	48–9	2	46		10	58		58
	46–7		14			14		14
	44–5		4			4		4
	42–3		2		1	3		3
	40–1				1	1		1
	39–							
	Total	50	886	5	113	1054	26	1080
	Unknown	2	8			10	4	14
	Grand Total	52	894	5	113	1064	30	1094

	Height in inches	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
3	70+			2		2		2
	68–9							
	66–7			2		2		2
	64–5		1			1		1
	62–3							
	60–1	2		2	1	5	1	6
	58–9	1	1	13	2	17		17
	56–7	4	3	53	7	67	2	69
	54–5	7	7	87	17	118	4	122
	52–3	6	7	75	11	99	3	102
	50–1	2	5	52	6	65	3	68
	48–9			9		9	3	12
	46–7			1		1		1
	44–5							
	42–3							
	40–1							
	39–							
	Total	22	24	296	44	386	16	402
	Unknown			2		2	1	3
	Grand Total	22	24	298	44	388	17	405

	Height in inches	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
4	70+				2	2		2
	68–9		1		1	2		2
	66–7		1			1		1
	64–5			1	1	2	1	3
	62–3		1	2	12	15		15
	60–1	4	2	1	58	65	1	66
	58–9	11	7	7	161	186	13	199
	56–7	38	21	8	408	472	25	497
	54–5	57	37	17	643	754	29	783
	52–3	49	31	15	578	673	21	694
	50–1	21	10	8	257	296	5	301
	48–9	7	4	2	69	82	1	83
	46–7	1	1		11	13		13
	44–5			1	9	10		10
	42–3				4	4		4
	40–1				1	1		1
	39–							
	Total	188	116	62	2212	2578	96	2674
	Unknown	3	1		12	16	5	21
	Grand Total	191	117	62	2224	2594	101	2695

TABLE 39—*continued*

HEIGHT BY LOCATION OF HOME FOR LOCATION OF BIRTHPLACE

x = height in inches with origin at 48·5 inches

Mean Height

Location of Birthplace

Location of Home		1	2	3	4	*Total*
	n	2590	39	10	83	2722
1	Σx	6492	107	24	260	6883
	Mean	53·76	54·24	53·55	55·02	53·81
	n	50	886	5	113	1054
2	Σx	135	2341	17	293	2786
	Mean	54·15	54·03	55·55	53·94	54·04
	n	22	24	296	44	386
3	Σx	68	65	791	123	1047
	Mean	54·93	54·16	54·09	54·34	54·17
	n	188	116	62	2212	2578
4	Σx	520	339	182	6206	7247
	Mean	54·28	54·59	54·62	54·36	54·37
	Migrants	54·31	54·46	54·54	54·38	54·39
ALL	Non-migrants	53·76	54·03	54·09	54·36	54·04
	All	53·81	54·11	54·19	54·36	54·08

TABLE 40

Weight by Location of Home for Location of Birthplace

Boys and Girls

Location of Home	*Weight in pounds*	*Location of Birthplace* 1	2	3	4	*Total*	*Unknown*	*Grand Total*
1	120+	3	1			4		4
	115–9	1				1	1	2
	110–4	5				5	1	6
	105–9	6	1			7	1	8
	100–4	13		1	1	15	2	17
	95–9	14			1	15	2	17
	90–4	38	1	1	1	41		41
	85–9	74	2		2	78	5	83
	80–4	152			9	161	2	163
	75–9	292	6	1	12	311	8	319
	70–4	438	6	2	20	466	13	479
	65–9	542	8		18	568	27	595
	60–4	510	6	3	14	533	15	548
	55–9	348	6	1	4	359	9	368
	50–4	122	2	1	1	126	3	129
	45–9	26				26		26
	40–4	6				6	2	8
	39–							
	Total	2590	39	10	83	2722	91	2813
	Unknown	18				18	8	26
	Grand Total	2608	39	10	83	2740	99	2839

Location of Home	*Weight in pounds*	*Location of Birthplace* 1	2	3	4	*Total*	*Unknown*	*Grand Total*
2	120+							
	115–9							
	110–4		2			2		[illegible]
	105–9		3			3		3
	100–4		3		1	4		4
	95–9		8			8		8
	90–4	1	13	1	1	16	1	17
	85–9		21		5	26	3	29
	80–4	1	62		7	70	2	72
	75–9	5	102		14	121	3	124
	70–4	10	168		19	197	2	199
	65–9	20	175	3	23	221	5	226
	60–4	10	174	1	21	206	7	213
	55–9	1	104		8	113	2	115
	50–4	1	34		11	46		46
	45–9	1	15		1	17		17
	40–4		1		1	2		2
	39–							
	Total	50	885	5	112	1052	25	1077
	Unknown	2	9		1	12	5	17
	Grand Total	52	894	5	113	1064	30	1094

Location of Home	*Weight in pounds*	*Location of Birthplace* 1	2	3	4	*Total*	*Unknown*	*Grand Total*
3	120+							
	115–9							
	110–4			1		1		1
	105–9			1		1		1
	100–4							
	95–9			2	1	3		3
	90–4	1		3		4		4
	85–9	2		12		14	1	15
	80–4	1	1	23	5	30	1	31
	75–9	4	3	31	3	41		41
	70–4	5	2	47	11	65	1	66
	65–9	6	6	56	13	81	2	83
	60–4	3	6	64	4	77	4	81
	55–9		3	46	5	54	5	59
	50–4		3	6	2	11	1	12
	45–9			4		4		4
	40–4							
	39–							
	Total	22	24	296	44	386	15	401
	Unknown			2		2	2	4
	Grand Total	22	24	298	44	388	17	405

Location of Home	*Weight in pounds*	*Location of Birthplace* 1	2	3	4	*Total*	*Unknown*	*Grand Total*
4	120+	1			9	10	2	12
	115–9				4	4		4
	110–4			1	8	9		9
	105–9			1	10	11	1	12
	100–4	1		1	12	14	1	15
	95–9		1		33	34		34
	90–4	5	4	2	58	69	4	73
	85–9	7		4	85	96	3	99
	80–4	16	8	4	186	214	10	224
	75–9	30	20	13	301	364	13	377
	70–4	29	26	15	443	513	27	540
	65–9	40	21	8	413	482	19	501
	60–4	35	20	9	360	424	12	436
	55–9	11	12	2	193	218	3	221
	50–4	6	2	1	66	75	1	76
	45–9	2	1		11	14		14
	40–4				4	4		4
	39–			1		1		1
	Total	183	115	62	2196	2556	96	2652
	Unknown	8	2		28	38	5	43
	Grand Total	191	117	62	2224	2594	101	2695

TABLE 40—*continued*

WEIGHT BY LOCATION OF HOME FOR LOCATION OF BIRTHPLACE

x = weight in pounds with origin at 62·0 pounds

Mean Weight

Location of Birthplace

Location of Home		1	2	3	4	*Total*
	n	2590	39	10	83	2722
1	Σx	3159	65	18	155	3397
	Mean	68·35	70·58	71·25	71·59	68·49
	n	50	885	5	112	1052
2	Σx	59	1154	9	133	6775
	Mean	68·15	68·77	71·25	68·19	68·69
	n	22	24	296	44	386
3	Σx	48	16	376	62	500
	Mean	73·16	65·58	68·60	69·30	68·73
	n	183	115	62	2196	2556
4	Σx	309	177	143	3994	4563
	Mean	70·69	69·95	73·78	71·34	71·18
	Migrants	70·41	69·50	73·29	69·57	70·22
ALL	Non-migrants	68·35	68·77	68·60	71·34	69·53
	All	68·53	68·89	69·57	71·17	69·60

TABLE 41

Size of Family by Location of Home for Location of Birthplace

Boys and Girls

Location of Home	Size of Family	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
1	1	283	4		13	300	17	317
	2	583	11	5	21	620	28	648
	3	568	11	3	22	604	20	624
	4	441	5	2	18	466	12	478
	5	307	1		6	312	9	323
	6	165	3		3	171	2	173
	7	114	2		3	119	1	120
	8	89	1			90	2	92
	9	41	1			42	1	43
	10	29				29	1	30
	11	13				13		13
	12	5				5		5
	13	2				2		2
	14	1				1		1
	15							
	16							
	Total	2641	39	10	86	2776	93	2869
	Unknown	16			3	19	7	26
	Grand Total	2657	39	10	89	2795	100	2895

Location of Home	Size of Family	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
2	1	12	105	1	12	130	4	134
	2	20	183	4	27	234	16	250
	3	8	172		25	205	20	225
	4	5	156		19	180	12	192
	5	4	83		8	95	8	103
	6	1	81		7	89	6	95
	7	1	49		8	58	3	61
	8	1	35		4	40	1	41
	9	1	14		2	17		17
	10		18			18	1	19
	11		8		1	9		9
	12		1			1		1
	13		1			1		1
	14							
	15							
	16							
	Total	53	906	5	113	1077	71	1148
	Unknown		2			2	1	3
	Grand Total	53	908	5	113	1079	72	1151

Location of Home	Size of Family	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
3	1	2	1	24	3	30	2	32
	2	7	4	70	10	91	9	100
	3	6	9	61	13	89	4	93
	4	1	6	53	7	67	6	73
	5	2		34	3	39	3	42
	6		2	26	3	31	4	35
	7			17	3	20	2	22
	8			6		6	2	8
	9	1		3		4		4
	10	1	1	2	2	6		6
	11			1		1	1	2
	12		1	1	1	3		3
	13			1		1		1
	14			1		1		1
	15							
	16							
	Total	20	24	300	45	389	33	422
	Unknown	2		1	1	5	1	6
	Grand Total	22	24	301	46	394	34	428

Location of Home	Size of Family	Location of Birthplace 1	2	3	4	Total	Unknown	Grand Total
4	1	33	25	10	232	300	34	334
	2	44	30	11	460	545	73	618
	3	50	26	8	457	541	53	594
	4	25	11	12	348	396	31	427
	5	13	8	9	256	286	28	314
	6	8	7	6	178	199	12	211
	7	7	3	2	125	137	14	151
	8	7	4	2	77	90	9	99
	9	2	1	2	60	65	1	66
	10	1	1		29	31		31
	11		1		18	19	1	20
	12		1		6	7		7
	13				6	6		6
	14		1		2	3		3
	15				5	5		5
	16				1	1		1
	Total	190	119	62	2260	2631	256	2887
	Unknown	3	1		9	13	5	18
	Grand Total	193	120	62	2269	2644	261	2905

TABLE 41—*continued*

SIZE OF FAMILY BY LOCATION OF HOME FOR LOCATION OF BIRTHPLACE

x = family size in units

Mean Family Size

Location of Home		*Location of Birthplace* 1	2	3	4	*Total*	*Unknown*	*Grand Total*
1	n	2641	39	10	86	2776	93	2869
	Σx	9554	133	27	262	9976	280	10256
	Mean	3·73	3·41	2·70	3·05	3·59	3·01	3·57
2	n	53	906	5	113	1077	71	1148
	Σx	146	3554	12	416	4128	259	4387
	Mean	2·75	3·92	2·40	3·68	3·83	3·65	3·82
3	n	20	24	300	45	389	33	422
	Σx	67	94	1149	176	1486	136	1622
	Mean	3·35	3·92	3·83	3·91	3·82	4·12	3·84
4	n	190	119	62	2260	2631	256	2887
	Σx	617	398	233	9051	10299	865	11164
	Mean	3·25	3·34	3·75	4·00	3·91	3·38	3·87
ALL	n	2904	1088	377	2504	6873	453	7326
	Σx	10384	4179	1421	9905	25889	1540	27420
	Mean	3·57	3·84	3·77	3·96	3·77	3·40	3·74

TABLE 42

Occupational Class by Location of Home for Location of Birthplace

Boys and Girls

Occupational Class	Location of Birthplace	Location of Home 1	2	3	4	Total	Percentage	Percentage of Migrants
1	1	73	5	1	13	92	45·5	21·7
	2	1	18	1	6	26	12·9	30·8
	3	1	1	7	1	10	5·0	30·0
	4	12	3	2	57	74	36·6	23·0
	Total	87	27	11	77	202		23·3
	Percentage	43·1	13·4	5·4	38·1		100·0	
	Unknown	12	3	3	18	36		
2	1	101	7	0	16	124	37·6	18·6
	2	3	35	1	8	47	14·2	25·5
	3	1	0	12	3	16	4·8	25·0
	4	7	5	1	130	143	43·3	9·1
	Total	112	47	14	157	330		15·8
	Percentage	33·9	14·2	4·2	47·6		99·9	
	Unknown	2	3	4	7	16		
3	1	94	5	1	7	107	48·6	12·1
	2	5	25	3	3	36	16·4	30·6
	3			4	2	6	2·7	33·3
	4	5	7	2	57	71	32·3	19·7
	Total	104	37	10	69	220		18·2
	Percentage	47·3	16·8	4·5	31·4		100·0	
	Unknown	13	3	1	18	35		
4	1	285	4	4	20	313	56·8	8·9
	2	7	75	1	6	89	16·2	15·7
	3	2		18	3	23	4·2	21·7
	4	10	15	6	95	126	22·9	24·6
	Total	304	94	29	124	551		14·2
	Percentage	55·2	12·1	5·3	22·5		100·1	
	Unknown	11	8	3	21	43		
5	1	1003	16	9	49	1077	44·7	6·9
	2	15	351	10	42	418	17·3	16·0
	3	4	2	136	25	167	6·9	18·6
	4	25	41	18	662	746	31·0	11·3
	Total	1047	410	173	778	2408		10·6
	Percentage	43·5	17·0	7·2	32·3		100·0	
	Unknown	37	25	12	84	158		

TABLE 42—*continued*

Occupational Class by Location of Home for Location of Birthplace

Boys and Girls

Occupational Class	*Location of Birthplace*	*Location of Home* 1	2	3	4	*Total*	*Percentage*	*Percentage of Migrants*
6	1	421	7	1	25	454	36·7	6·3
	2	2	197	5	20	224	18·1	12·1
	3	14	1	78	8	101	8·2	22·8
	4	8	16	5	428	457	37·0	6·3
	Total	445	221	89	481	1236		9·1
	Percentage	36·0	17·9	7·2	38·9		100·0	
	Unknown	8	13	5	38	64		
7	1	579	7	6	24	616	51·7	6·0
	2	4	176	2	14	196	16·4	10·2
	3	1	1	39	7	48	4·0	18·7
	4	7	20	7	298	332	27·9	10·2
	Total	591	204	54	343	1192		8·4
	Percentage	49·6	17·1	4·5	28·8		100·0	
	Unknown	12	14	6	19	51		
8	1	3			12	15	11·3	80·0
	2		2		2	4	3·0	50·0
	3			1	2	3	2·3	66·7
	4		1		110	111	83·5	0·9
	Total	3	3	1	126	133		12·8
	Percentage	2·3	2·3	0·7	94·8		100·1	
	Unknown		1		11	12		
9	1	9			19	28	6·3	67·9
	2	1	4	1	14	20	4·5	80·0
	3			2	10	12	2·7	85·3
	4	6	4	3	371	384	86·4	3·4
	Total	16	8	6	414	444		13·1
	Percentage	3·6	1·8	1·4	93·2		100·0	
	Unknown	1	1		30	32		

TABLE 43

Occupancy Rate by Location of Home for Location of Birthplace

Boys and Girls

Location of Home	Occupancy Rate	Location of Birthplace 1	2	3	4	Total
1	1	146	5	1	14	166
	2	1001	16	7	35	1059
	3	848	9	2	22	881
	4	627	8		12	647
	Total	2622	38	10	83	2753
	Unknown	35	1		5	41
	Grand Total	2657	39	10	88	2794
2	1	10	47	1	10	68
	2	22	338	4	49	413
	3	15	356		34	405
	4	6	162		19	187
	Total	53	903	5	112	1073
	Unknown		5		1	6
	Grand Total	53	908	5	113	1079
3	1	3	3	13	3	22
	2	13	5	130	19	167
	3	4	13	101	12	130
	4	2	3	54	9	68
	Total	22	24	298	43	387
	Unknown			3	3	6
	Grand Total	22	24	301	46	393
4	1	32	20	7	218	277
	2	85	46	29	1035	1195
	3	43	20	14	665	742
	4	26	32	11	334	403
	Total	186	118	61	2252	2617
	Unknown	7	2	1	18	28
	Grand Total	193	120	62	2270	2645

x=occupancy rate in coding units

Location of Home		Location of Birthplace 1	2	3	4
1	n	2622	38	10	83
	$\sum x$	7200	96	21	198
	Mean	2·75	2·53	2·10	2·39
2	n	53	903	5	112
	$\sum x$	123	2439	9	286
	Mean	3·32	2·70	1·80	2·55
3	n	22	24	298	43
	$\sum x$	49	64	792	113
	Mean	2·23	2·67	2·66	2·63
4	n	186	118	61	2252
	$\sum x$	435	300	151	5619
	Mean	2·34	2·54	2·48	2·50

Each Location of Home for All Locations of Birthplace

	Location of Home 1	2	3	4	All
Mean (excluding birthplace unknown)	2·73	2·66	2·63	2·49	2·62
Mean (including birthplace unknown)	2·65	2·64	2·63	2·47	2·60

TABLE 44

Children (a) Living in or near, and (b) Not Living in or near, Birthplace, by Location of Home, by Occupational Class (Manual or Non-Manual), for Family Size

Boys and Girls

Location of Home	(a) Living at Birthplace Manual	Non-Manual	Total	Un-known	Grand Total	(b) Not Living at Birthplace Manual	Non-Manual	Total	Un-known	Grand Total	Percentage not Living at Birthplace Manual	Non-Manual	Grand Total
Family Size 1 and 2													
1	569	271	840	28	868	43	60	103	4	107	7·0	18·1	11·0
2	230	107	337	10	347	21	28	49		49	8·4	20·7	12·4
3	77	28	105	2	107	9	13	22		22	10·5	31·7	17·1
4	386	232	618	24	642	126	146	272	17	289	24·6	38·6	31·1
Unknown													
Total	1262	638	1900	64	1964	199	247	446	21	467	13·6	27·9	19·2
Family Size 3 and 4													
1	764	216	980	28	1008	53	36	89	4	93	6·5	14·3	8·4
2	303	66	369	11	380	28	15	43	1	44	8·5	18·5	10·4
3	120	17	137		137	17	7	24	1	25	12·4	29·2	15·4
4	487	249	736	15	751	127	129	256	8	264	20·7	34·1	26·0
Unknown	2		2		2								
Total	1676	548	2224	54	2278	225	187	412	14	426	11·8	25·4	15·8
Family Size 5 and Over													
1	674	79	753	26	779	25	13	38	3	41	3·6	14·1	5·0
2	300	27	327	1	328	17	9	26		26	5·4	25·0	7·3
3	99	9	108	2	110	7	5	12	1	13	6·6	35·7	10·6
4	546	179	725	17	742	75	112	187	1	188	12·1	38·5	20·2
Unknown	2	1	3		3								
Total	1621	295	1916	46	1962	124	139	263	5	268	7·1	32·0	12·0
All Sizes of Family*													
1	2011	566	2577	82	2659	123	110	233	11	244	5·8	16·3	8·4
2	833	201	1034	22	1056	66	52	118	1	119	7·3	20·6	10·1
3	296	54	350	4	354	33	25	58	2	60	10·0	31·6	14·5
4	1419	660	2079	56	2135	328	387	715	26	741	18·8	37·0	25·8
Unknown	4	1	5		5								
Total	4563	1482	6045	164	6209	550	574	1124	40	1164	10·8	27·9	15·8

*Including family size unknown

TABLE 45

CHILDREN (*a*) LIVING WITH AND (*b*) NOT LIVING WITH OWN MOTHER, BY LOCATION OF HOME, BY OCCUPATIONAL CLASS (MANUAL OR NON-MANUAL), FOR FAMILY SIZE

Location of Home	(a) Living with Own Mother: Manual	Non-Manual	Total	Un-known	Grand Total	(b) Not Living with Own Mother: Manual	Non-Manual	Total	Un-known	Grand Total	Percentage not Living with Own Mother: Manual	Non-Manual	Grand Total
Family Size 1 and 2													
1	564	312	876	25	901	48	19	67	7	74	7·8	5·7	7·6
2	228	125	353	10	363	23	10	33		33	9·2	7·4	8·3
3	82	37	119	2	121	4	4	8		8	4·7	9·8	6·2
4	445	332	777	25	802	67	46	113	16	129	13·1	12·2	13·9
Unknown													
Total	1319	806	2125	62	2187	142	79	221	23	244	9·7	8·9	10·0
Family Size 3 and 4													
1	763	242	1005	24	1029	54	10	64	8	72	6·6	4·0	6·5
2	308	76	384	10	394	23	5	28	2	30	6·9	6·2	7·1
3	128	24	152		152	9		9	1	10	6·6		6·2
4	582	350	932	18	950	32	28	60	5	65	5·2	7·4	6·4
Unknown	2		2		2								
Total	1783	692	2475	52	2527	118	43	161	16	177	6·2	5·9	6·5
Family Size 5 and Over													
1	671	91	762	26	788	28	1	29	3	32	4·0	5·7	3·9
2	302	33	335	1	336	15	3	18		18	4·7	7·4	5·1
3	99	11	110	3	113	7	3	10		10	6·6	9·8	8·1
4	584	271	855	12	867	37	20	57	6	63	6·0	12·2	6·8
Unknown	2	1	3		3								
Total	1658	407	2065	42	2107	87	27	114	9	123	5·0	8·9	5·5
All Sizes of Family*													
1	2004	646	2650	75	2725	130	30	160	18	178	6·1	4·4	6·1
2	838	235	1073	21	1094	61	18	79	2	81	6·8	7·1	6·9
3	309	72	381	5	386	20	7	27	1	28	6·1	8·9	6·8
4	1611	953	2564	55	2619	136	94	230	27	257	7·8	9·0	8·9
Unknown	4	1	5		5								
Total	4766	1907	6673	156	6829	347	149	496	48	544	6·8	7·2	7·4

*Including family size unknown

TABLE 46

Children Attending Private Schools, by Occupational Class and Family Size

		Private Schools												Percentage	
		Occupational Class													
Family Size	*All Thirty-six-day Sample*	1	2	3	4	5	6	7	8	9	*Total*	*Un-known*	*Grand Total*	*All Thirty-six-day Sample*	*Private Schools*
1	819	16	4	9	6	6	1				42	2	44	11·1	20·1
2	1618	35	8	20	13	14		1	3		94	3	97	21·9	44·3
3	1537	19	4	6	3	5			1		38	2	40	20·8	18·3
4	1169	7	1	1	2	3	1	5	1		21	1	22	15·8	10·0
5	782	1		1		2	2	2			8		8	10·6	3·7
6	514	2					1	1			4		4	7·0	1·8
7	354	1	1								2		2	4·8	0·9
8	240													3·3	
9	130													1·8	
10	86													1·2	
11	44													0·6	
12	15													0·2	
13	10													0·1	
14	5													0·1	
15	5													0·1	
16	1														
Unknown	52											2	2	0·7	0·9
Total	7381	81	18	37	24	30	5	9	5		209	10	219	100·1	100·0
All Thirty-six-day Sample															
Boys		120	178	128	274	1295	631	625	70	242	3563				
Girls		116	165	126	316	1266	657	611	75	231	3563				
Both		236	343	254	590	2561	1288	1236	145	473	7126				
Percentage at Private Schools															
Boys		37·5	6·7	18·0	5·1	1·4	0·8	1·0	1·4	0·0	3·5				
Girls		31·0	3·6	11·1	3·2	1·3	0·2	0·3	5·3	0·0	2·5				
Both		34·3	5·2	14·6	4·1	1·4	0·5	0·6	3·4	0·0	3·0				

TABLE 47

CHILDREN (*a*) EVACUATED AND (*b*) NOT EVACUATED DURING WAR, BY LOCATION OF HOME BY OCCUPATIONAL CLASS (MANUAL OR NON-MANUAL), FOR FAMILY SIZE

Location of Home	(*a*) Evacuated *Manual*	*Non-Manual*	*Total*	(*b*) Not Evacuated *Manual*	*Non-Manual*	*Total*	Percentage Evacuated *Manual*	*Non-Manual*	*Total*
Family Size 1 and 2									
1	169	104	273	443	227	670	27·6	31·4	29·0
2	25	16	41	226	119	345	10·0	11·9	10·6
3	6	5	11	80	36	116	7·0	12·2	8·7
4	34	27	61	478	351	829	6·6	7·1	6·4
Unknown									
Total	234	152	386	1227	733	1960	16·0	17·2	16·5
Family Size 3 and 4									
1	243	87	330	574	165	739	29·7	34·5	30·9
2	37	6	43	294	75	369	11·2	7·4	10·4
3	10	3	13	127	21	148	7·3	12·5	8·1
4	32	24	56	582	354	936	5·2	6·3	5·6
Unknown	1		1	1		1			
Total	323	120	443	1578	615	2193	17·0	16·3	16·8
Family Size 5 and Over									
1	196	22	218	503	70	573	28·0	23·9	27·6
2	27	1	28	290	35	325	8·5	2·8	7·9
3	6		6	100	14	114	5·7		5·0
4	32	19	51	589	272	861	5·2	6·5	5·6
Unknown	2		2		1	1			
Total	263	42	305	1482	392	1874	15·1	9·7	14·0
All Sizes of Family*									
1	609	213	822	1525	463	1988	28·5	31·5	29·3
2	89	24	113	810	229	1039	9·9	9·5	9·8
3	22	8	30	307	71	378	6·7	10·1	7·4
4	98	70	168	1649	977	2626	5·6	6·7	6·0
Unknown	3		3	1	1	2			
Total	821	315	1136	4292	1741	6033	16·1	15·3	15·8

*Including family size unknown

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